SolidPlant P&ID Training Manual

SolidPlant P&ID

All New, All you need!

www.SolidPlant3d.com
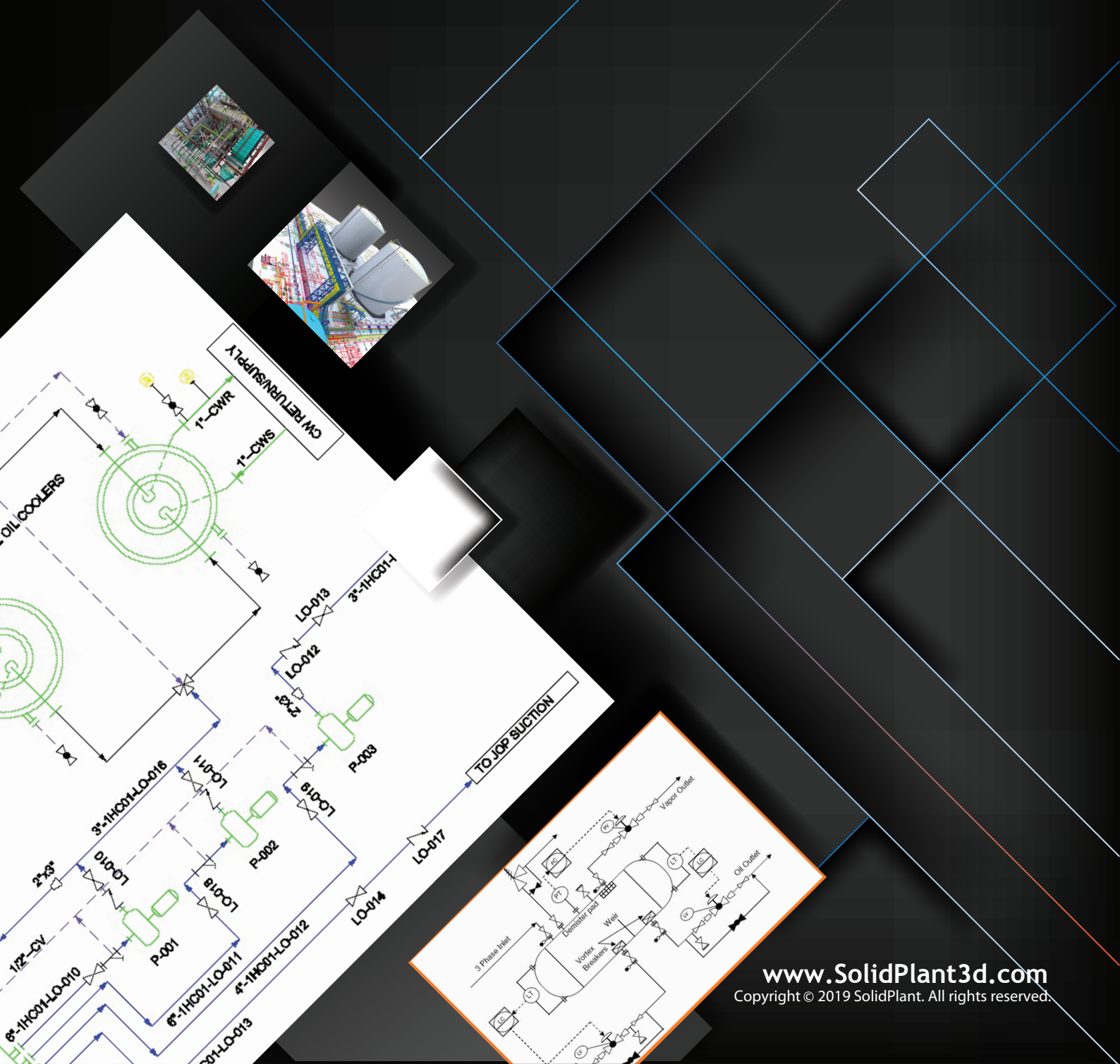
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Overview 1

Welcome to the SolidPlant P&ID Training Manual.

This guide provides introductory best-practice workflows and tasks that prepare you for working in SolidPlant P&ID. Each chapter contains a workflow diagram for each major project or drawing. Each workflow is a visual representation of the specific exercises that follow the workflow.

Introduction to SolidPlant P&ID

The P&ID is the key input for all the piping activities. It is very important for piping design engineers to read, understand and interpret the P&ID (process design) that leads to the mechanical system (3D).

SolidPlant P&ID is a product for engineers and designers in the Plant Design Industries who need to create, modify, and manage Piping and Instrumentation Diagrams. With SolidPlant P&ID it is simple to generate project reports, and manage changes between engineering teams and contractors.

SolidPlant P&ID is easy to learn for users who are familiar with 2D applications, but need the benefits of generating engineering reports from the information contained in the project drawings. Create and edit using powerful drafting tools that increase drawing productivity. Manage and share information between multiple engineering disciplines with importing and exporting tools that allow you to work in a concurrent engineering environment.

SolidPlant P&ID with SolidPlant 3D makes creating and Designing your Project easy and efficient, offering many benefits to EPCs and Owner Operators.

This application provides a library of symbols that you can access from a tool palette and then place in your drawing. We use schematic lines that move when you move equipment and that display the flow direction.

You work exclusively in a project environment, so that your drafting is consistent with others working in the same project.

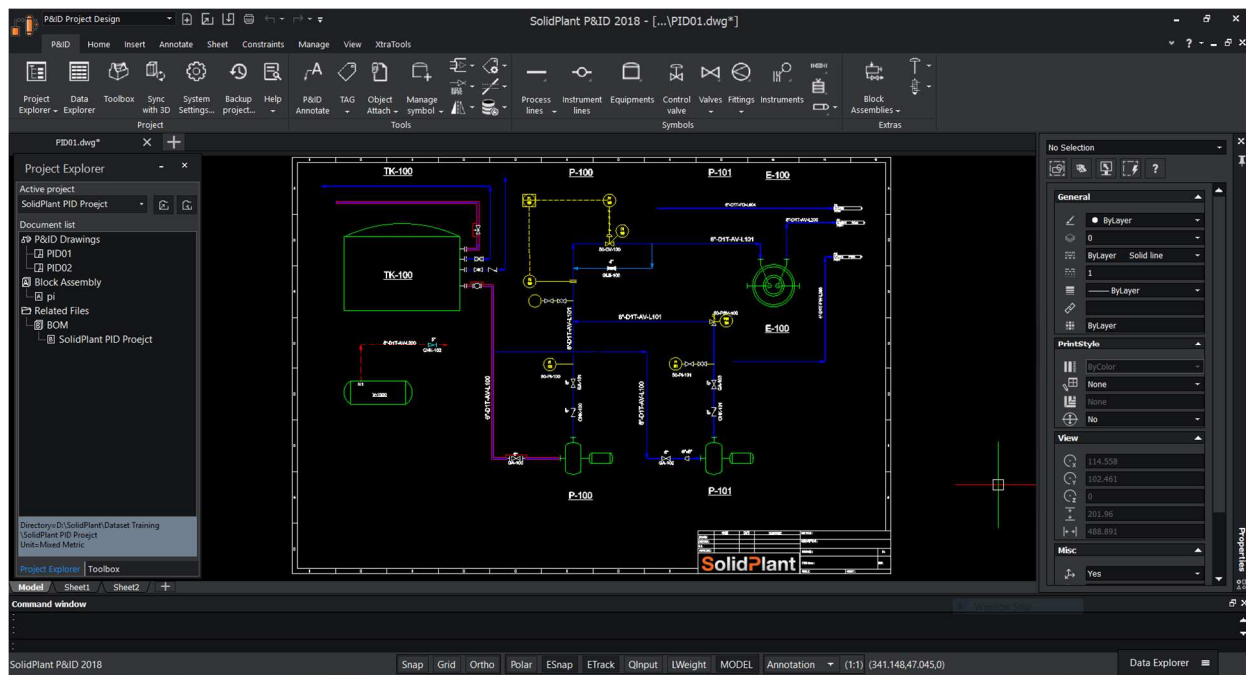You can create reports for a single drawing or an entire project.

Welcome Splash Screen

The Welcome splash screen is displayed during startup of SolidPlant P&ID.
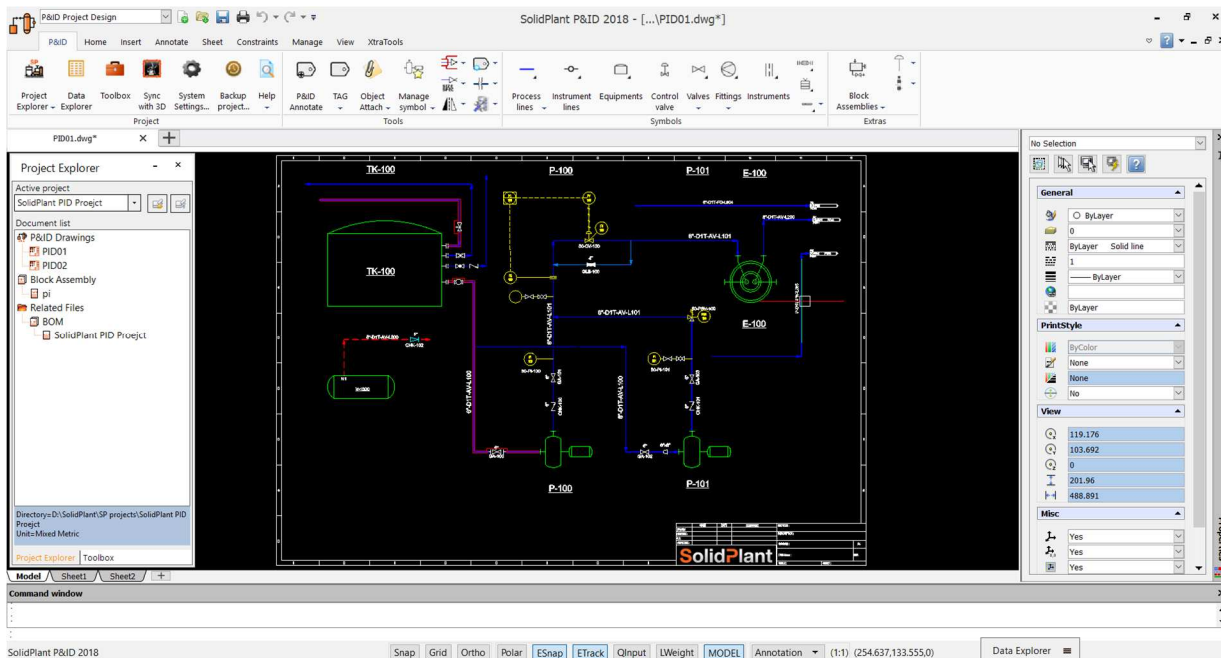

The User Interface

SolidPlant P&ID user interfaces come in two different styles/themes dark and white.

To switch the user interface right-click on the P&ID tool palette and select **"switch UI style"**

After you restart SolidPlant P&ID, the UI style will change.

P&ID Workspaces

A workspace consists of a ribbon and palettes that are organized in such a way that you can work in a custom, task-oriented drawing environment.

SolidPlant P&ID includes palettes that help you create, design, modify and report on P&ID-specific information. The P&ID Library tool palette contains the relevant P&ID components and lines which are used to create a P&ID.
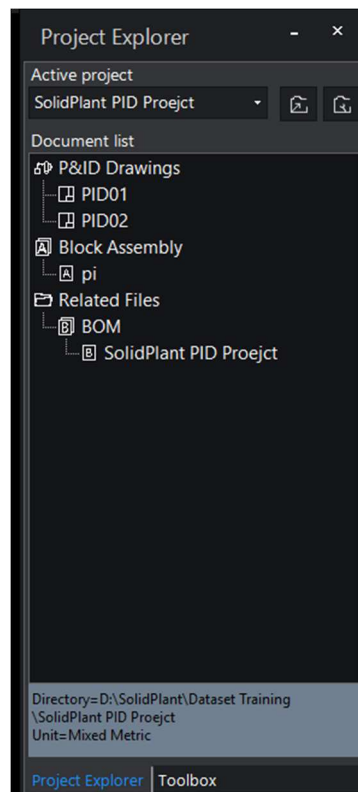
Project Explorer

The Project explorer provides an organized project environment in which to work. You can create a new project, open an existing project, link, and create drawings. You can also export and import data, create project reports, and perform other project tasks.

If the Project Explorer is not already displayed, access it from the P&ID Tools menu

> Project Explorer or by entering PROJE on the command line.

SolidPlant P&ID Project Explorer

Using the Project Explorer, you can:

- Create new projects and drawings.

- Open existing projects and drawings.

- Add a drawing to the project.

- Export project data to Microsoft Excel 2003 or later.

- Access the Project location folder.

P&ID Ribbon

The P&ID ribbon displays grouped icons that provide quick access to creating or editing schematic lines and line groups.

It also provides quick access to the project Explorer, Data Manager, Tool Box and many more important functions.
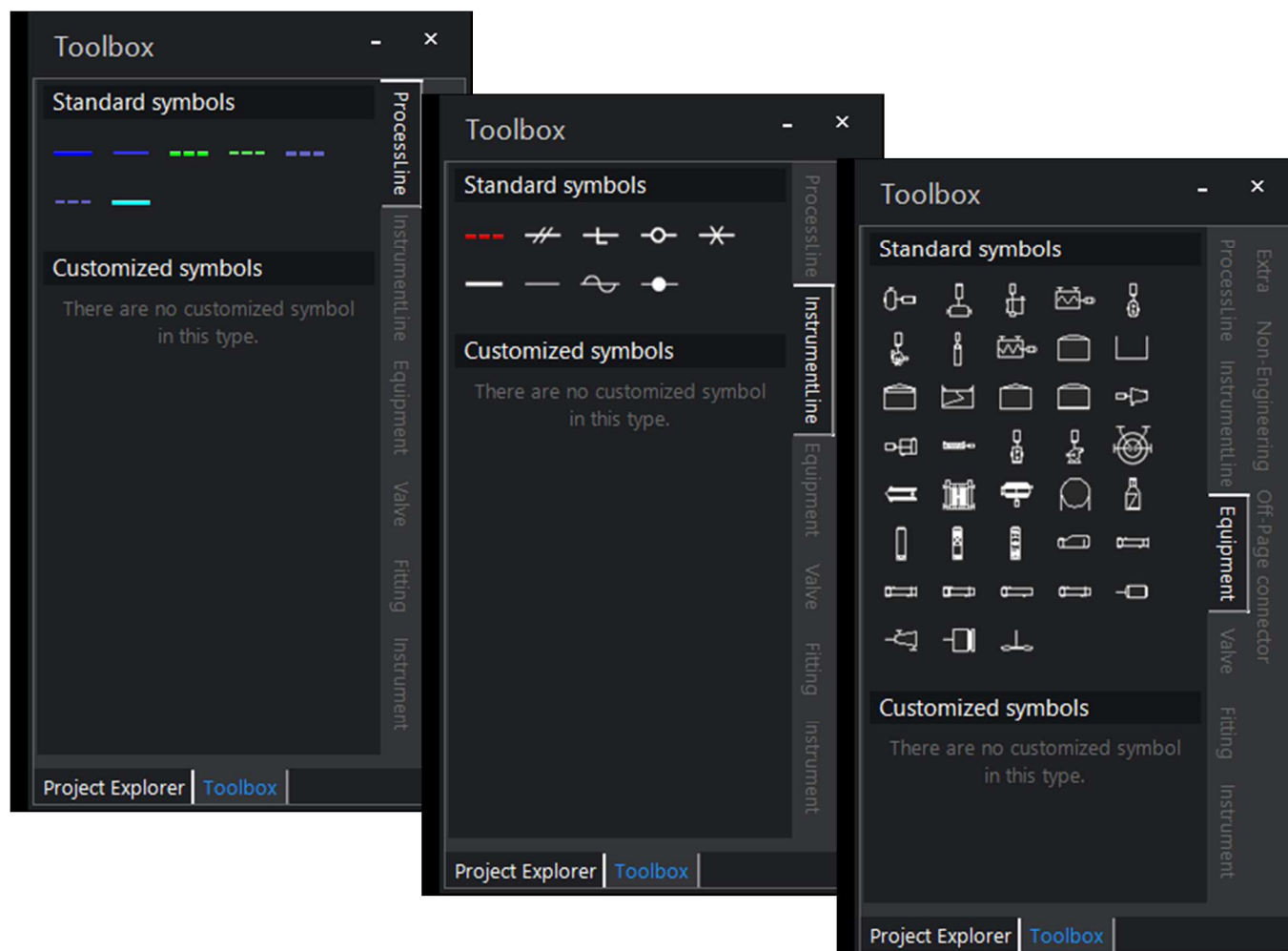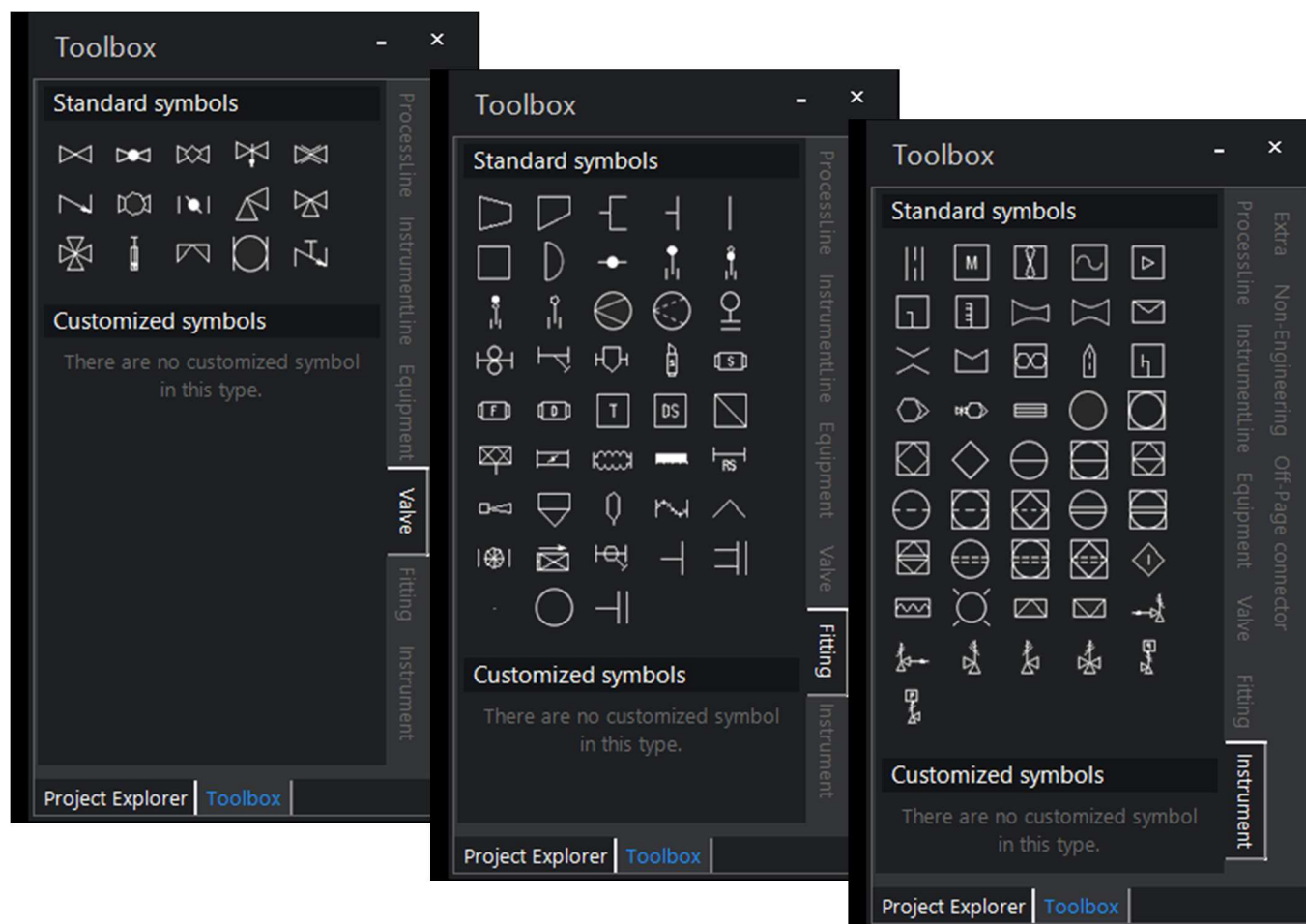

SolidPlant "P&ID" Tool Palette

Tool Box

The Tool box displays all the standard component and line symbols for your P&ID drawings. Different types are categorized in different tabs.

The following illustration displays all the symbols of SolidPlant P&ID.

Data Explorer

SolidPlant P&ID provides a unique method to display the complete information of the P&ID, whether it is a line, equipment, instruments, fittings or components. All the data of the P&ID will be listed in the Data Explorer in a categorized manner. We use an Excel-like interface for defining the associated data for all the symbols in P&ID.

The Data Explorer can be accessed in the following ways:

- From the menu, P&ID > 🗔 Data Explorer
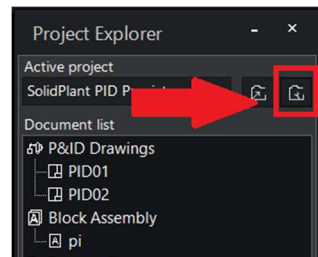
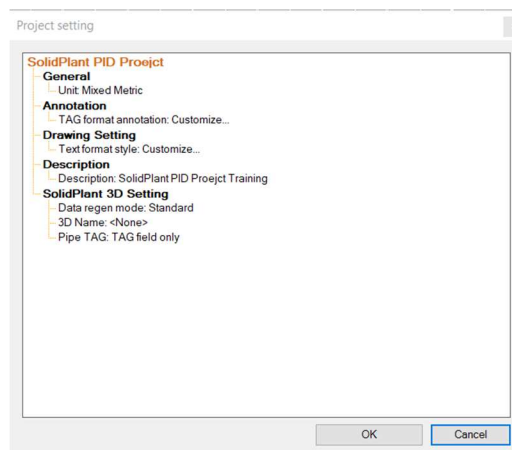- Enter DATAE at the command prompt
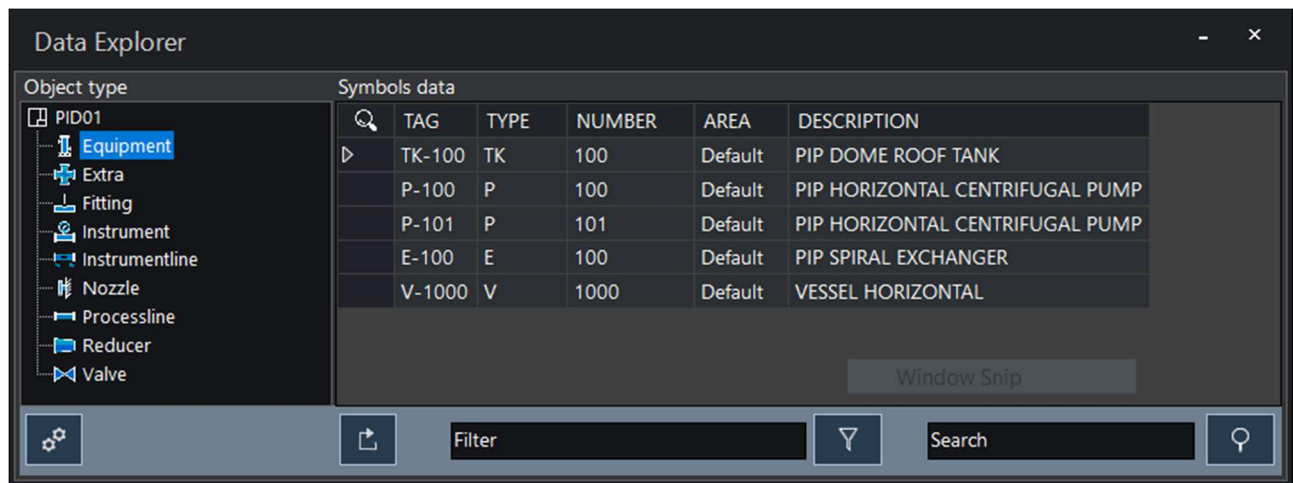
SolidPlant P&ID Data Manager

Project Settings

To access project settings, click on project setting icon in project explorer.

Project setting button

After you click on the project setting button, a dialogue box will pop-up as below.
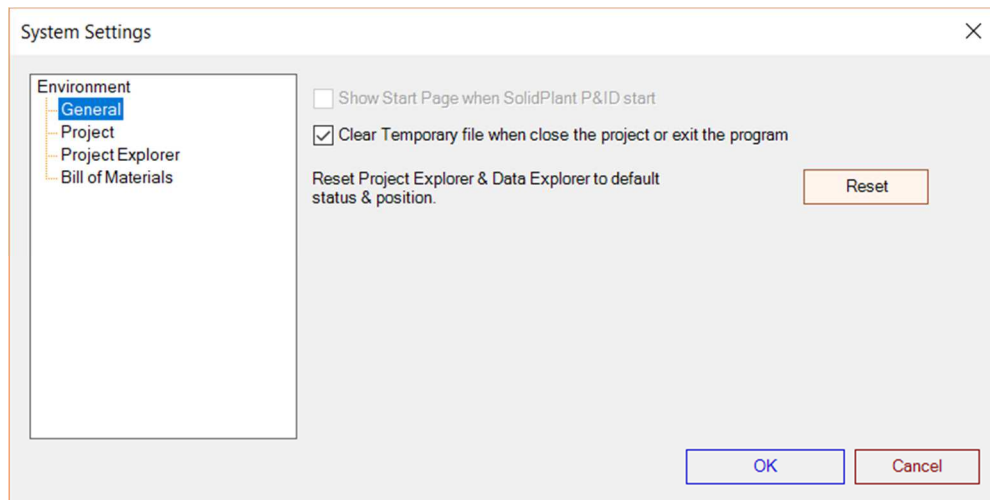

Project setting dialogue box

System Settings

System settings in SolidPlant P&ID helps users to reset the project explorer & data explorer if it's missing in the interface, and also to locate the drawing template location.

To access system settings, click on system settings icon ⚙ on the P&ID tool palette. A dialogue box will open same as below:


Reset Project Explorer & Data Explorer

To locate the default drawing template, click on the "Project" tab in System Settings
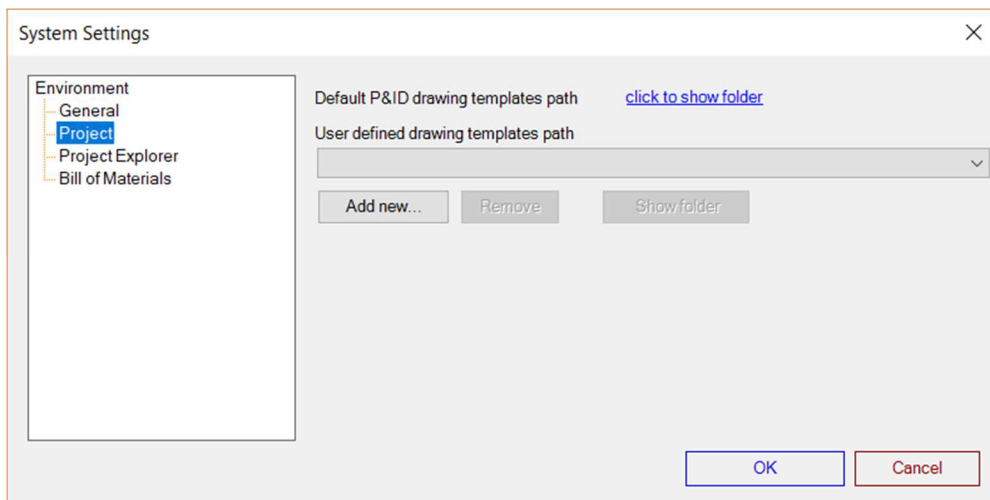

Note: To add a user-defined template, just paste your template in the templates folder.

How to Import a Project?

To Import an existing project of SolidPlant P&ID which is not attached to database, simply click on Open Project button in Project Explorer
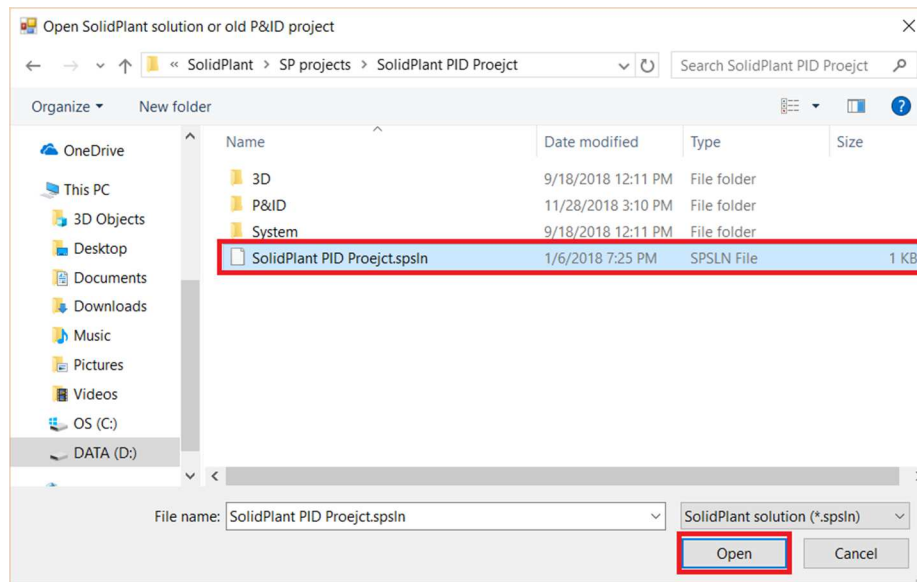

Open Project button
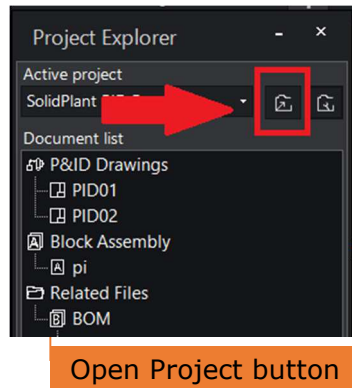
Browse to the location where you copied the SolidPlant P&ID project and open the project folder. You will see the folder structure as below.
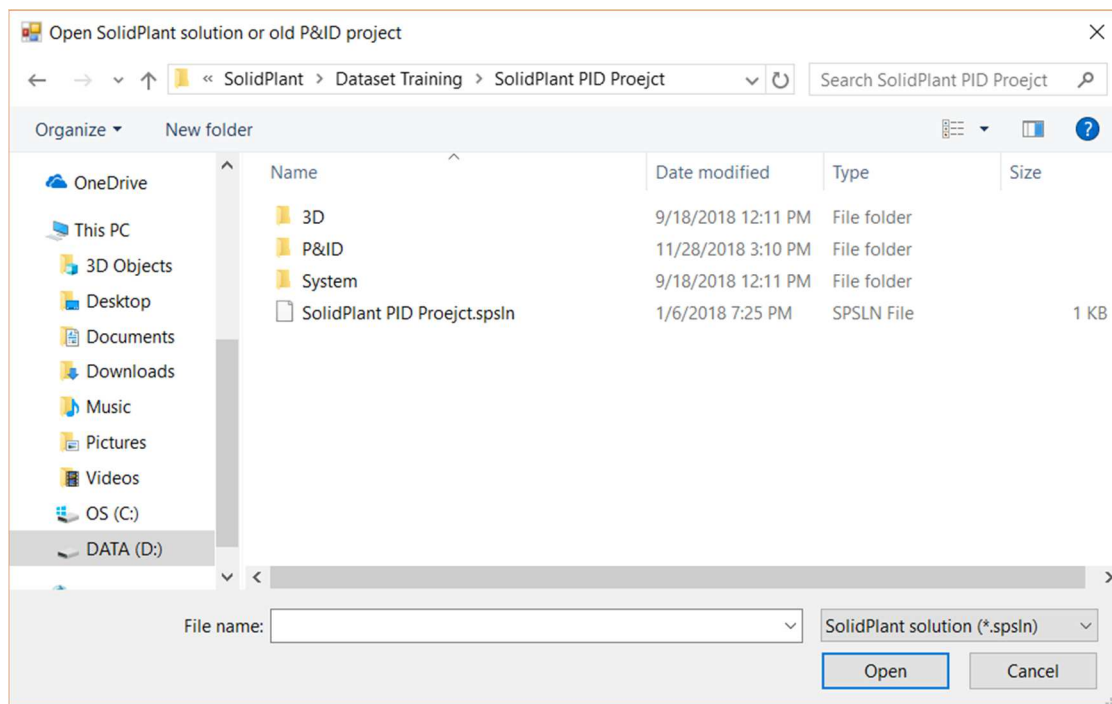
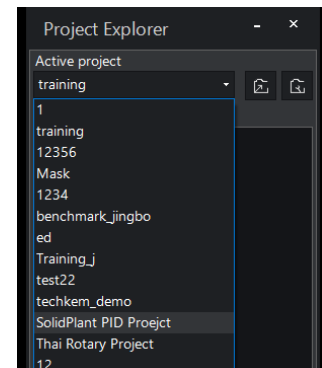Now select the **".spsln"** and click on **"Open".**

After the successful import of the database you will get a "project successfully imported" message.

How to Open a Project?

After the successful import of an existing project, you will see the project name in the project explorer under "Active Project". Drop down the active project and select the project name.
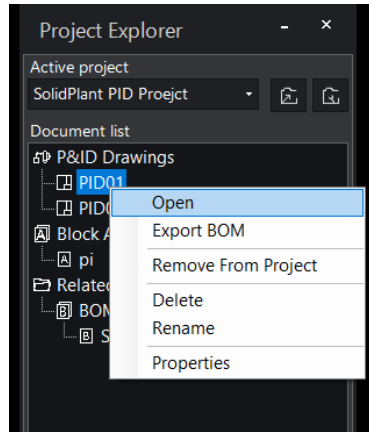

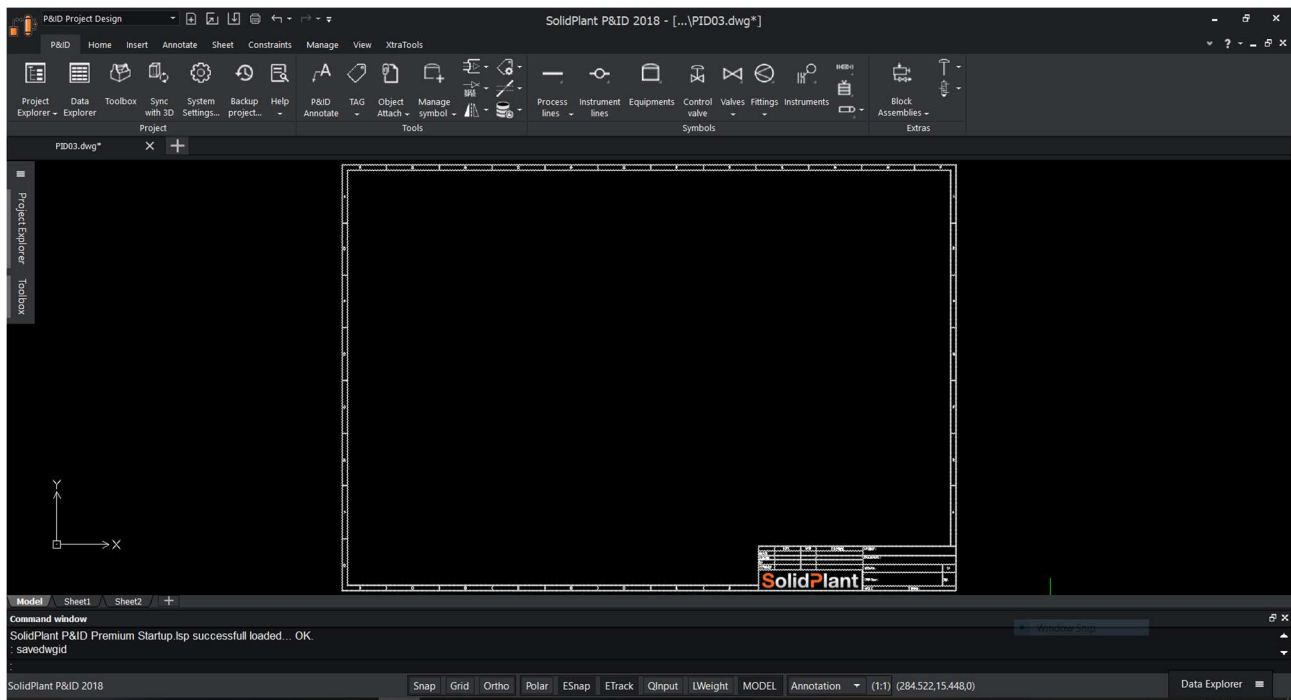You will see the folder structure of the loaded project as below.
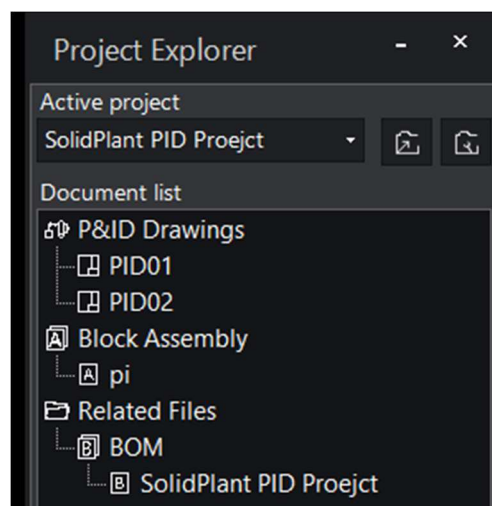
How to Open a Drawing File?

To open a drawing file, you can either double click on the drawing name, or right click on drawing file and select "Open".

A drawing template will open

Create a Project 2
& organize settings
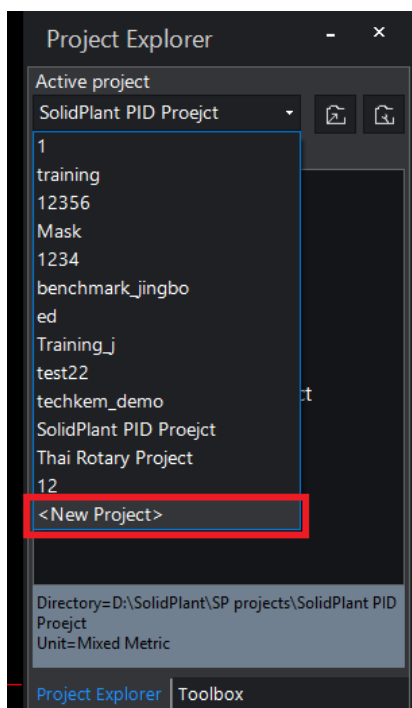
Use the Project Explorer to create and organize the P&ID projects in SolidPlant P&ID.

The work flow in the next topic describes how to create a new project and drawings in SolidPlant P&ID.

How to Create a New Project

To Create a Project, click on

Project Explorer > Active Project (Drop down)> New project

Project setup dialogue box will pop up.

In the Project Setup Wizard, enter the information related to the project as below and hit **"Next"** button and **"Create"** button in the dialogue box 'step 2' page.
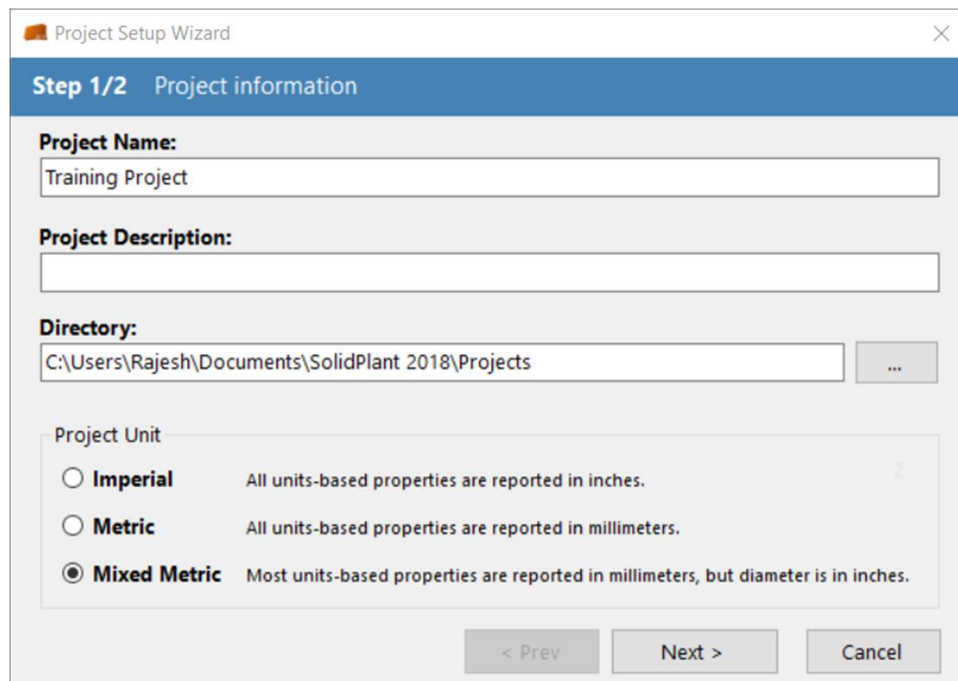
Project Name: Name of the Project.

Project Description: Description of the Project (if any)
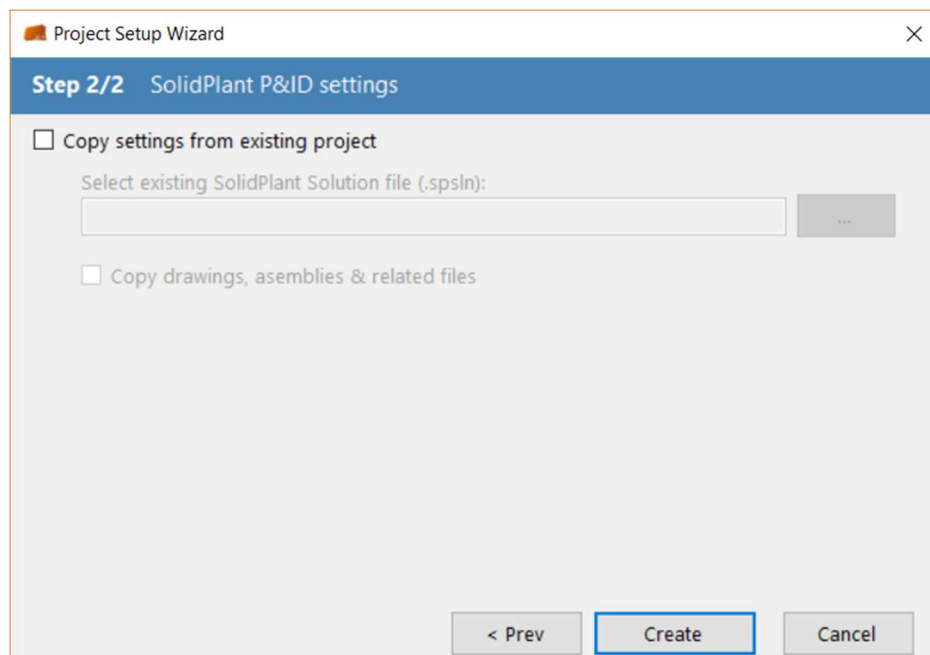
Directory: The location of the folder where you want to store your project files.
Default location is C drive, user's documents, SolidPlant 2018, Projects.

Units: User can select in which units they want to design their 3D project. Units are helpful when you synchronize the project with SolidPlant 3D.

SolidPlant P&ID Project Setup Wizard
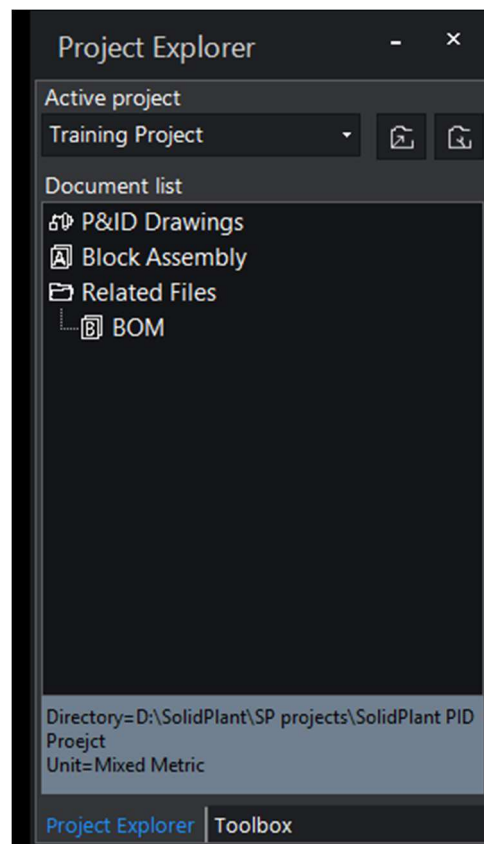
After you hit the Create button, a database will be created and you will get a message saying that the project is created.
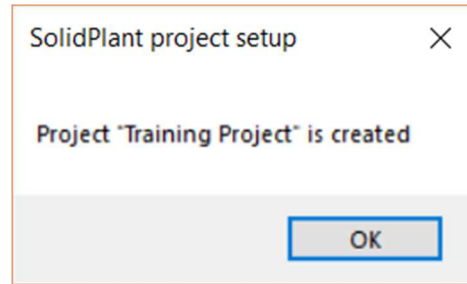
Click on **"OK"**

In the project explorer you will see the project name under active project.

In Document List you will see P&ID Drawings, Block Assembly and Related Files.
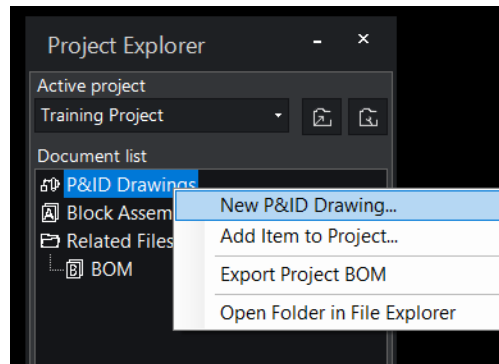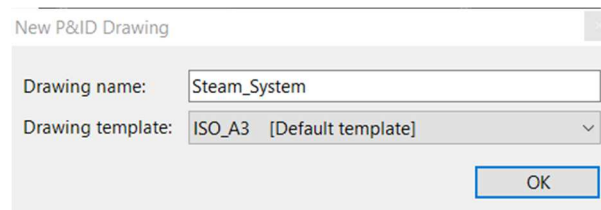
Create a New Drawing File

After you create the project, you need to create the drawing file in order to start designing your P&ID.
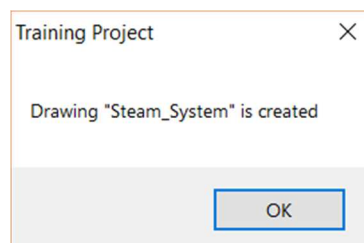
To create a drawing:

Project Explorer > P&ID Drawings (Right Click) > New P&ID Drawing

In the New P&ID Dialogue Box, enter the Drawing Name, select the desired size of the drawing Template from the drop down, then click **"OK".**
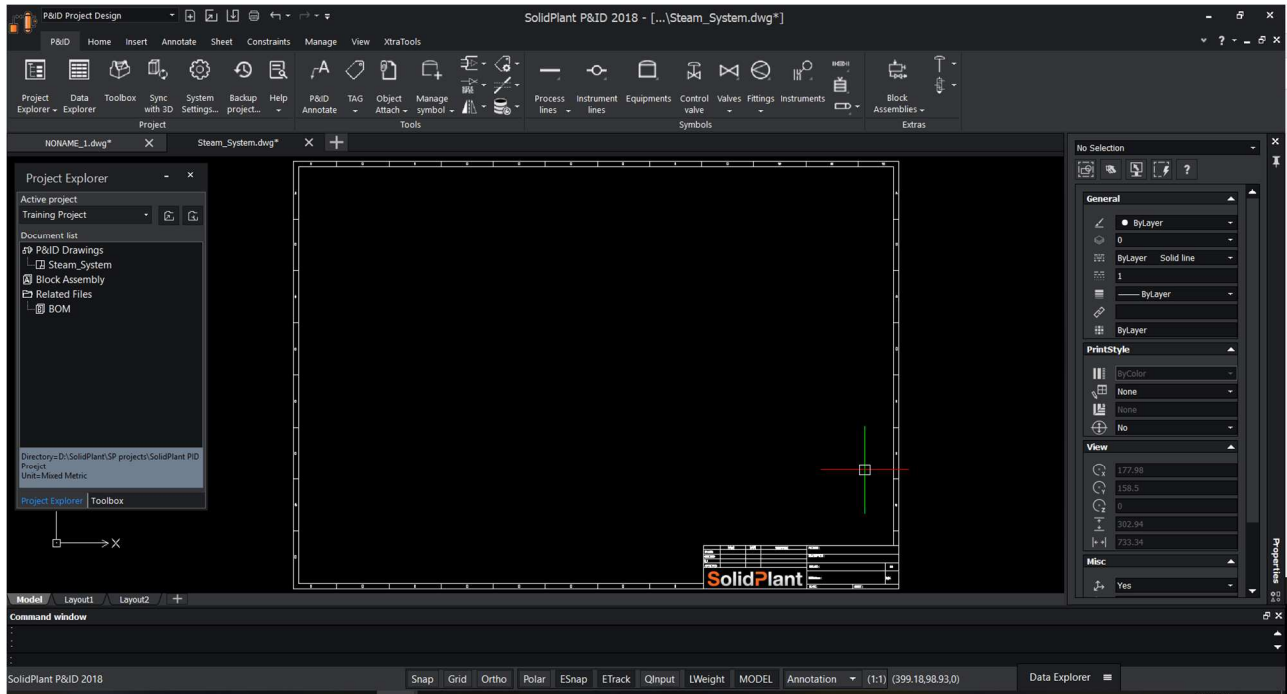

After the successful creation of the drawing file in the database, you will get a message saying that the drawing file is created.

Next, either you can double click on the drawing name in the project explorer or right-click and open
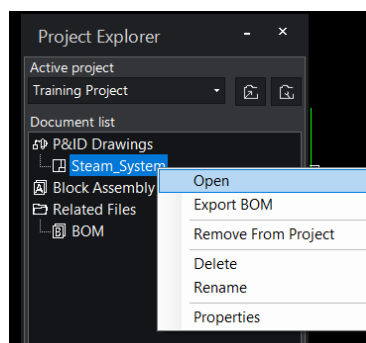
Default drawing template will be opened same as below.

Organize project setting

Every organization will have their own standards in representing annotations and tags. To fulfill this requirement SolidPlant P&ID has a settings tab which will help you organize your own standard of annotations.
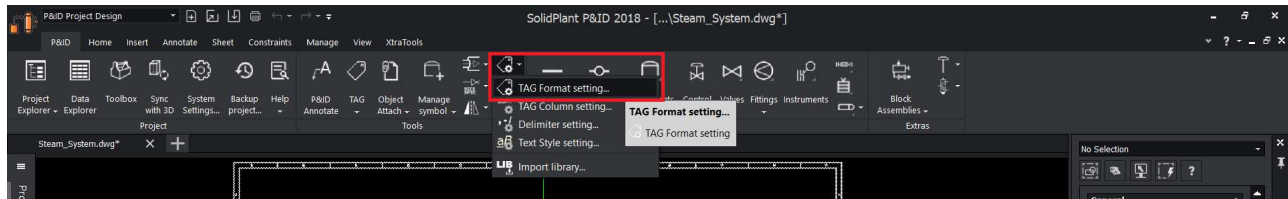
- I.   TAG Format setting
- II.   TAG Column setting
- III. Delimiter setting
- IV.   Text Style setting

TAG Format setting

Tag format setting help you organize the annotation style for the entire P&ID project, whether it is Equipment, Process line, Nozzle, Instrument, Extra or Fitting.

Tag Format setting will also help you in creating different annotation styles for particular types ex: Process line and Jacketed Lines

To access tag format setting, click on P&ID -> Tools Group -> drop down "setting".

After you click the Tag format setting you will notice a Tag setting dialogue box pop-up as below.
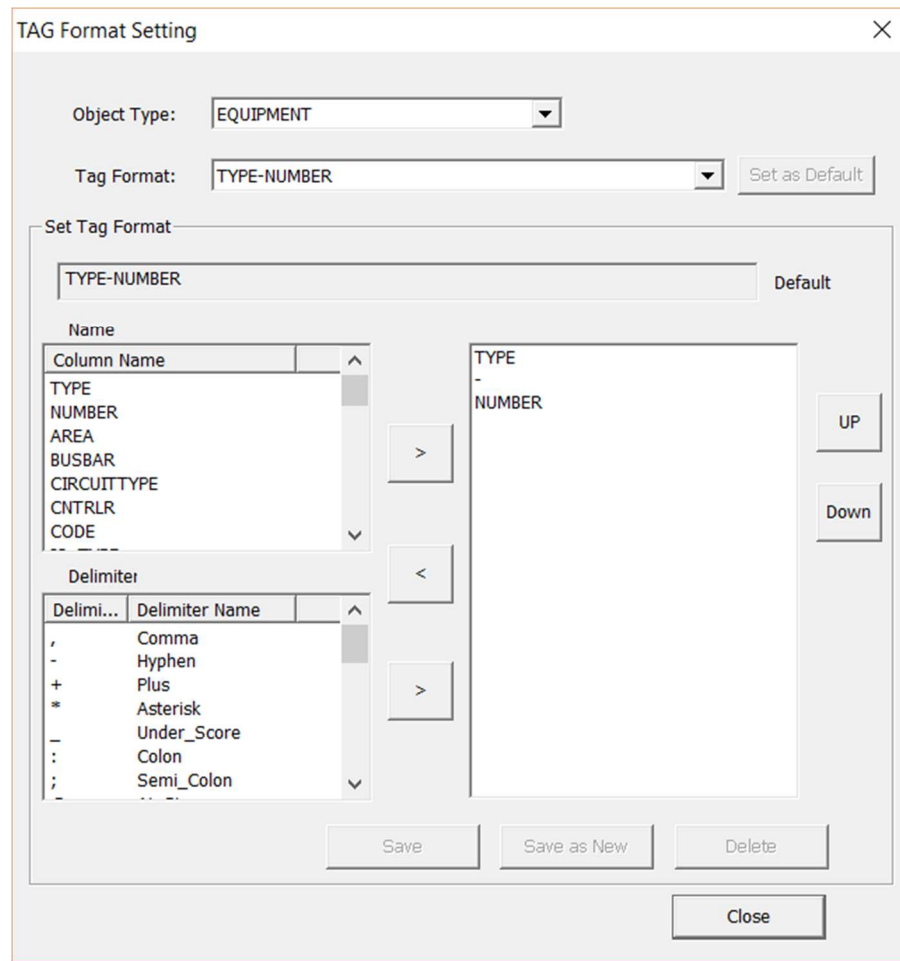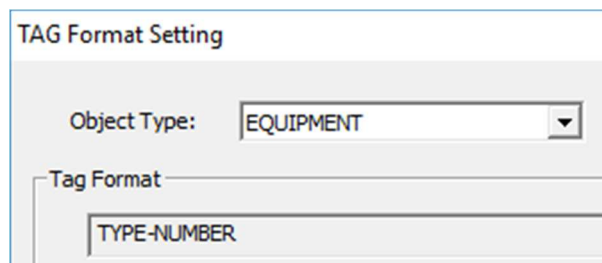

If you observe carefully you will notice there is **"Object Type"** and **"Tag Format".**

Object type: Here you can select the type of object or category in which you want to modify the annotation style.

For example: currently displayed is equipment. If you drop down you will notice different objects that you can modify separately.
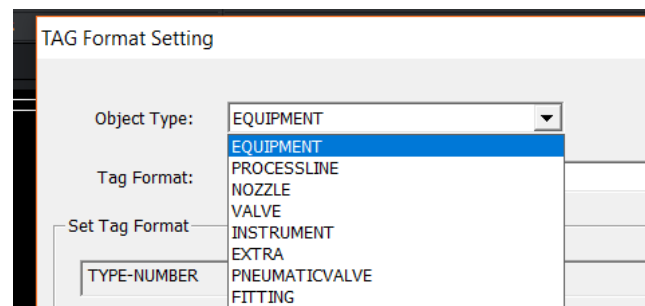
Tag Format: This is the preview format of the annotation that will be placed and shown in the drawing.

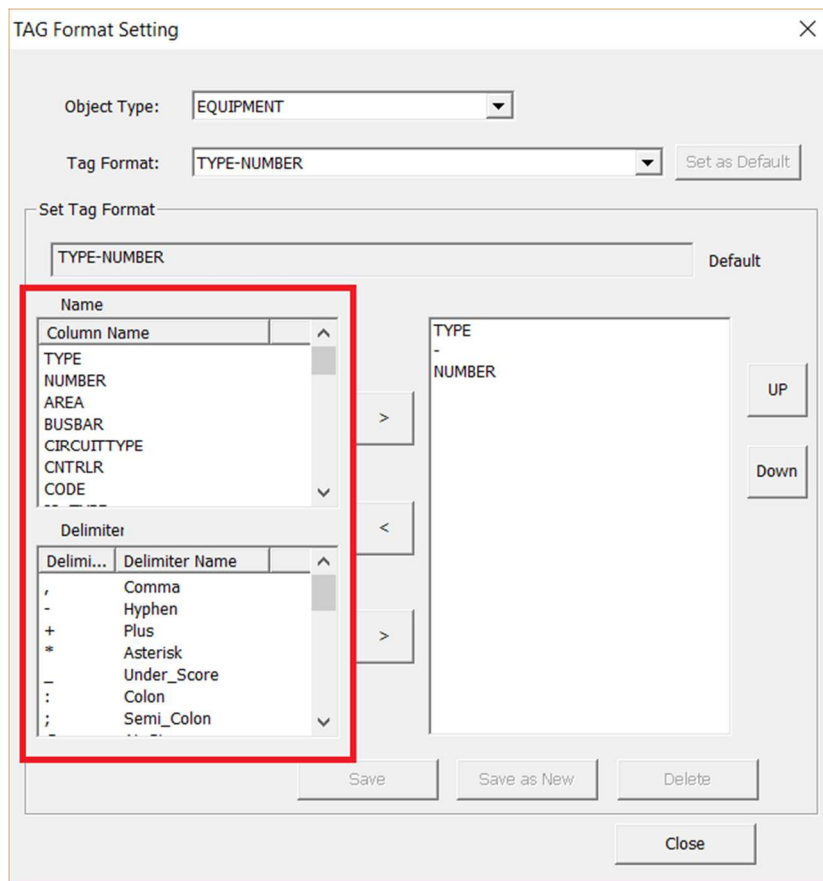In this following exercise we will see how to change the annotation style for equipment and process lines.

Tag Format for Equipment

Tag Format can be modified or created as new annotation style for each type or category.

Modifying existing Tag format

Before you modify any changes, please make sure that the object type is the one that you want to edit. In this case it should be **"Equipment".**
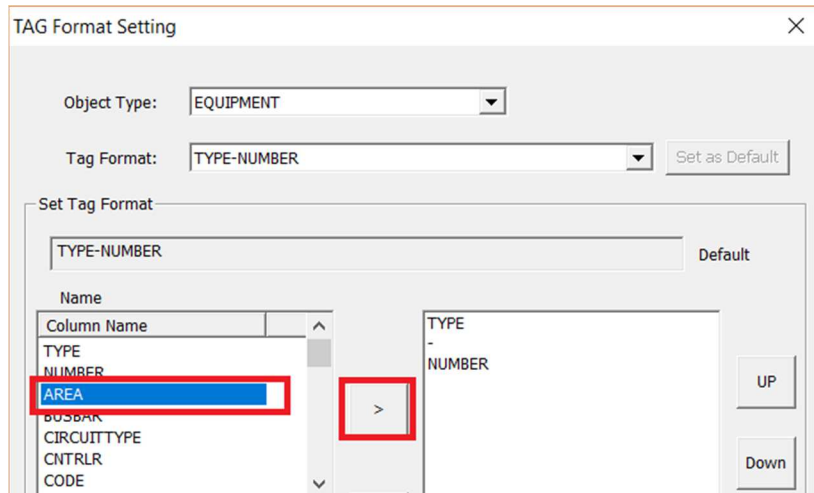
The Tag format of the equipment by default is **"Type-Number",** to modify this annotation style into **"Area-Type-Number"**, you should use name and delimiter fields.
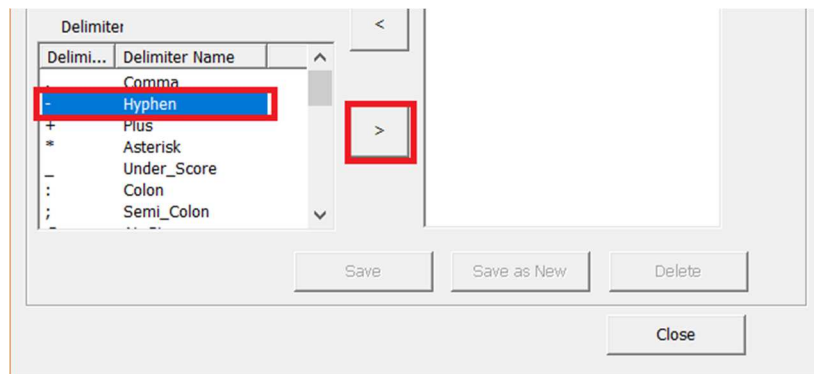

Now select the "Area" from the Name field and use > button to bring it to the right-
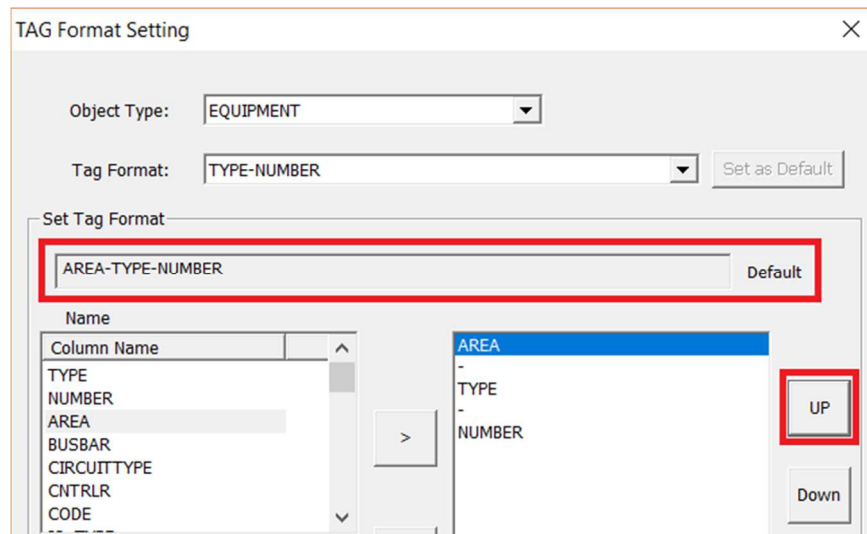
hand side.

Then bring the delimiter in the same manner.

Use "Up" or "Down" button to modify the placing of "Area" and "hyphen" and change it as below.

You can also notice the set tag format (preview) has now changed to "Area-Type-Number".

After your modification is complete, click on "Save" button to save the changes to the database.

Creating New Tag format

Instead of modifying the existing tag, if you want to create a new Tag format for any of the categories, in order to use different annotation styles for different objects, please make sure that the object type highlights the one that you want to edit. In this case it should be **"Equipment".**

The Tag format of the equipment by default is **"Type-Number",** to create a new annotation style as **"Number-Type-Area"**, you should use name and delimiter fields.
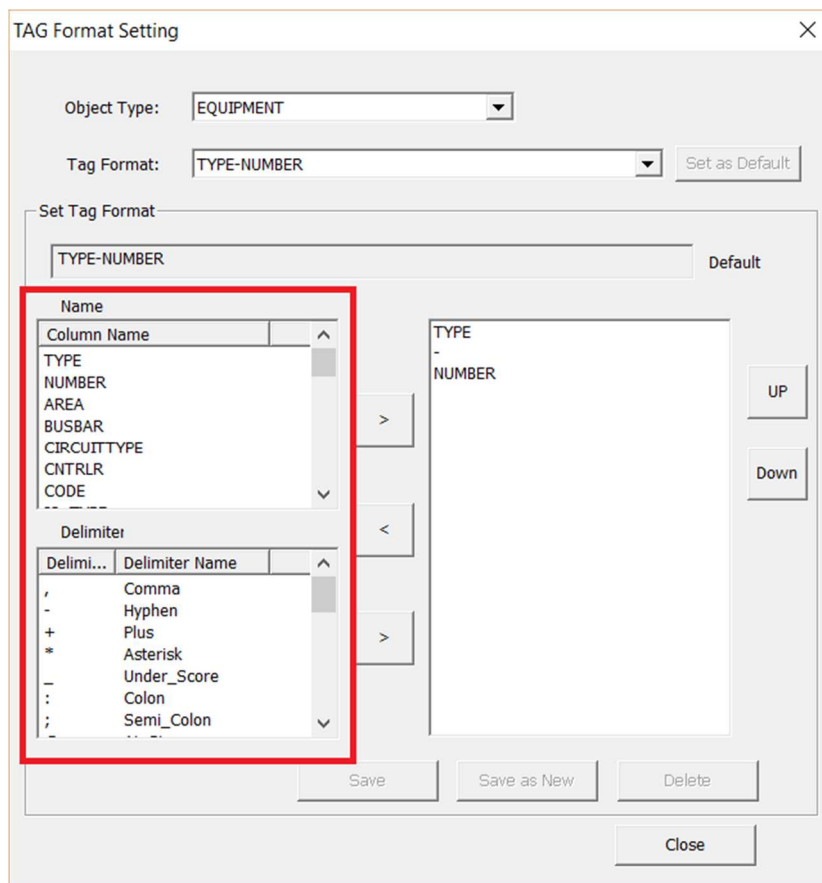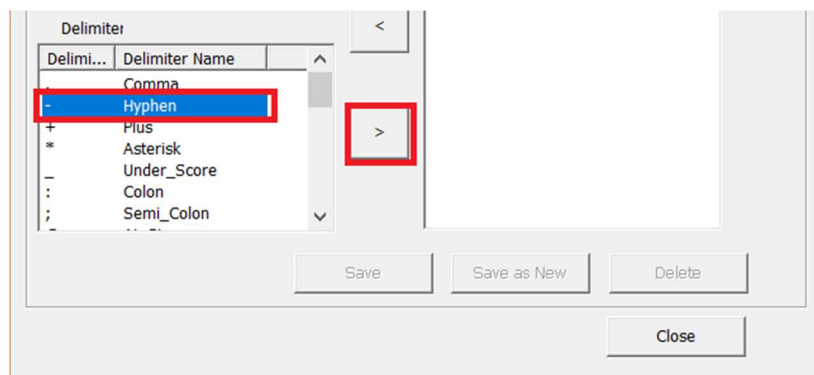
Now select the "Area" from the Name field and use > button to bring it to the right-hand side.
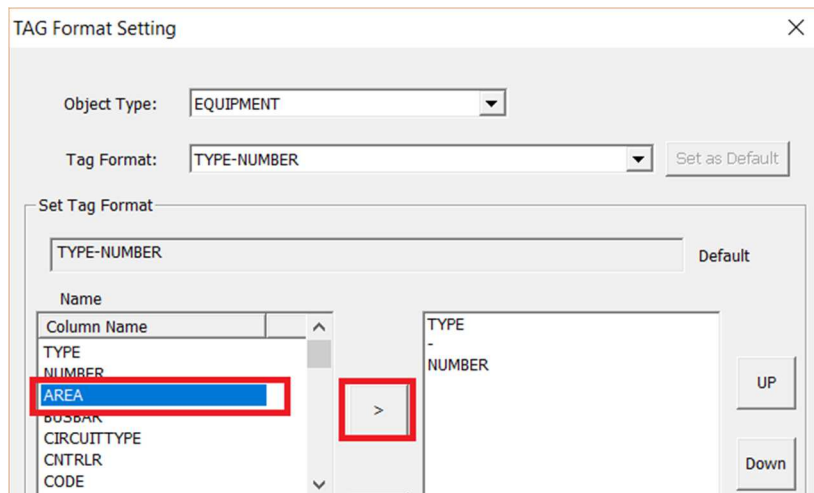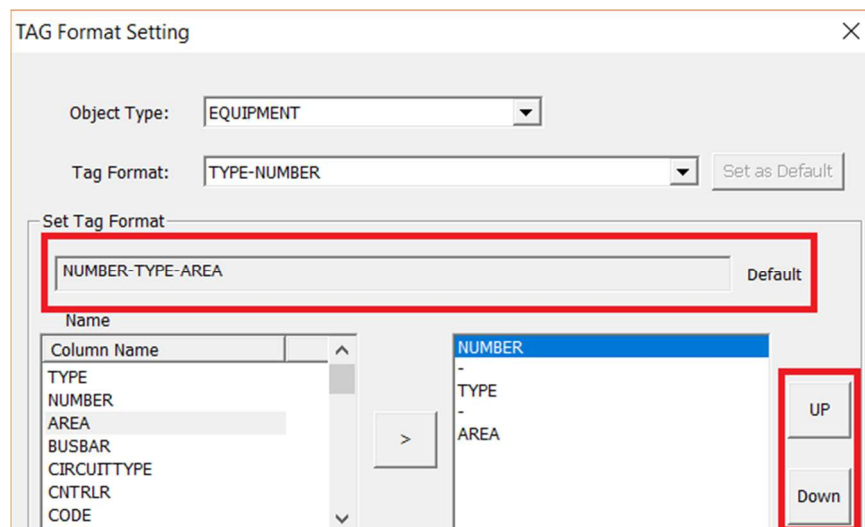
Then bring the delimiter in the same manner.

Use "Up" and "Down" button to modify the placing of "Type, Number and Area" and change it as below.


You can also notice the set tag format (preview) has now changed to "Area-Type-Number".

After your modification is complete, click on "Save as New" button to save the changes to the database.

Once you save the data, the new tag will appear in the drop down of the tag format, you can select which type you want to make as default by selecting **"Set as Default"** button. So, that annotation style will appear first in the assign tag dialogue box.
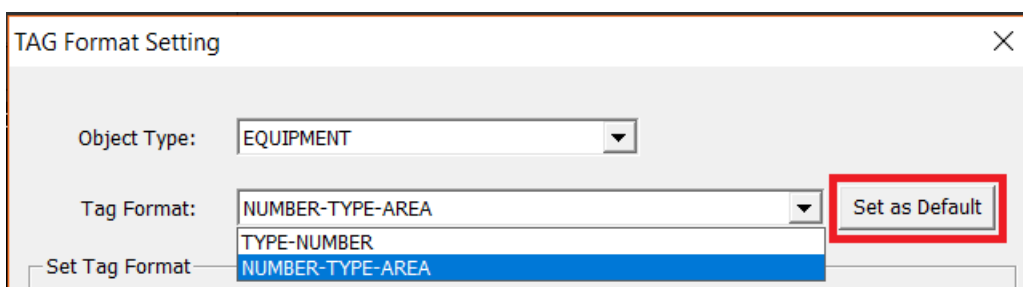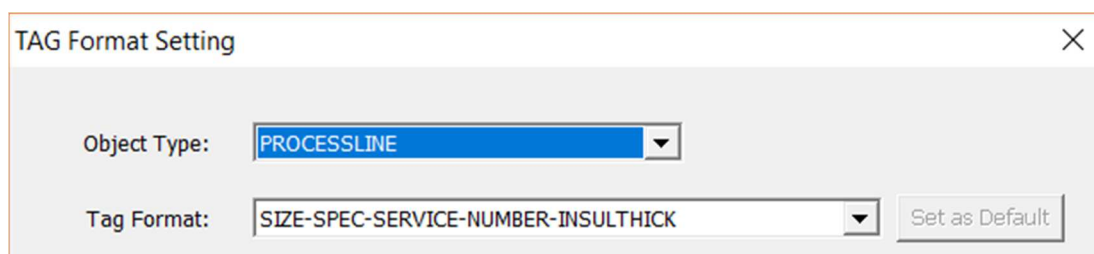

After selecting the default style, **"Close"** the tag format setting dialogue box.

Tag Format for Process Line

In the same way we will modify the annotation style of process line.

Select Process line in the Object Type drop-down. The default tag format is:

"size-spec-service-number-insulation thickness"

Let's remove the insulation thickness from this annotation style. Select the "Insulthick" from the right-hand field and use < button to remove, also remove the hyphen.
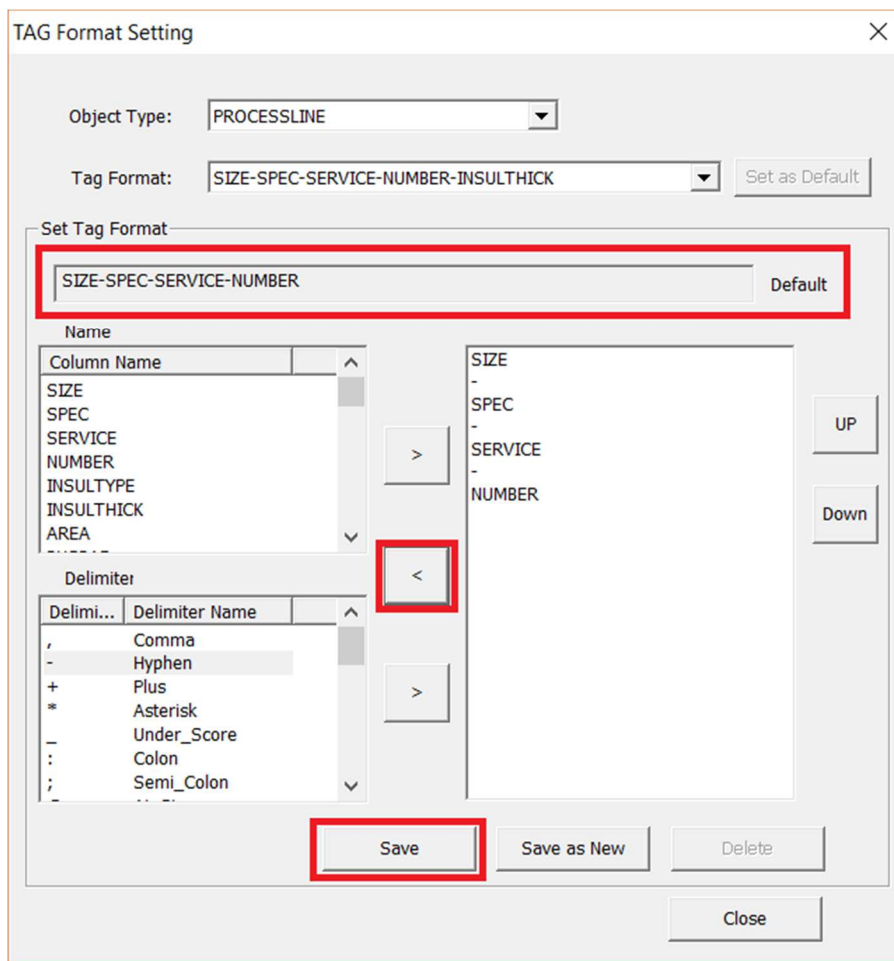

The set tag format field should now look like the picture above. Now **save** the changes.

Creating New Tag format

Instead of modifying the existing tag, if you want to create a new Tag format for any of the category, in order to use different annotation styles for different objects, please make sure that the object type highlights the one that you want to edit. In this case it should be **"Processline".**

The Tag format of the process line by default is **"size-spec-service-number-insulation thickness",** to create a new annotation style as **"Number-Spec-Service-Size"**, you should use name and delimiter fields.

First remove the INSULTHICK using < button and change the placing of the number, service and spec using "Up/Down" buttons. The set Tag format should look same as below picture.
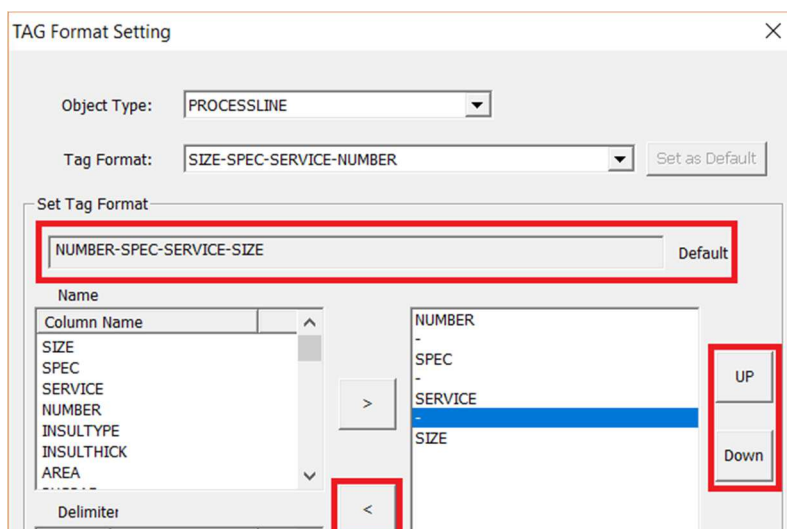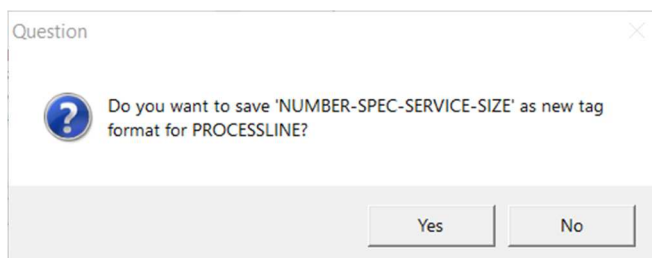

You can also notice the set tag format (preview) has now changed to "Number-spec-service-size".
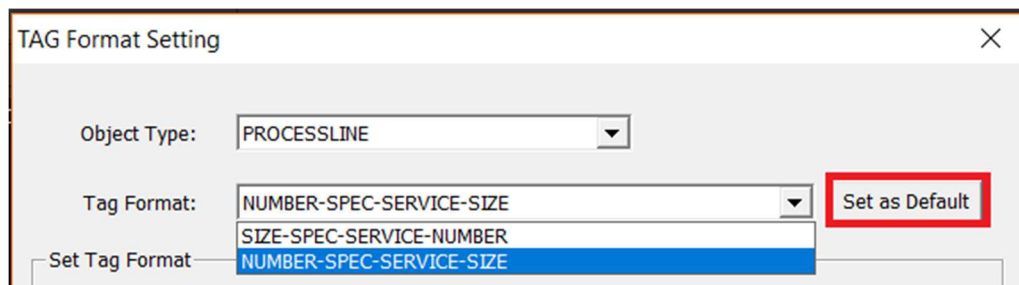
After your modification is complete, click on "Save as New" button to save the changes to the database.


Click on **yes**

Once you save the data, the new tag will appear in the drop down of the 'tag format'. You can select which type you want to make as default by selecting **"Set as Default"** button. So, that annotation style will appear first in the assign tag dialogue box.

After selecting the default style **"Close"** the tag format setting dialogue box.

Delete a Tag Format style

To delete any of the unused or unrequired tag format styles, you can simply select the tag style in tag format drop down and click on **"Delete"**. Click on Yes for warning, then the tag style will be deleted from the project and database.
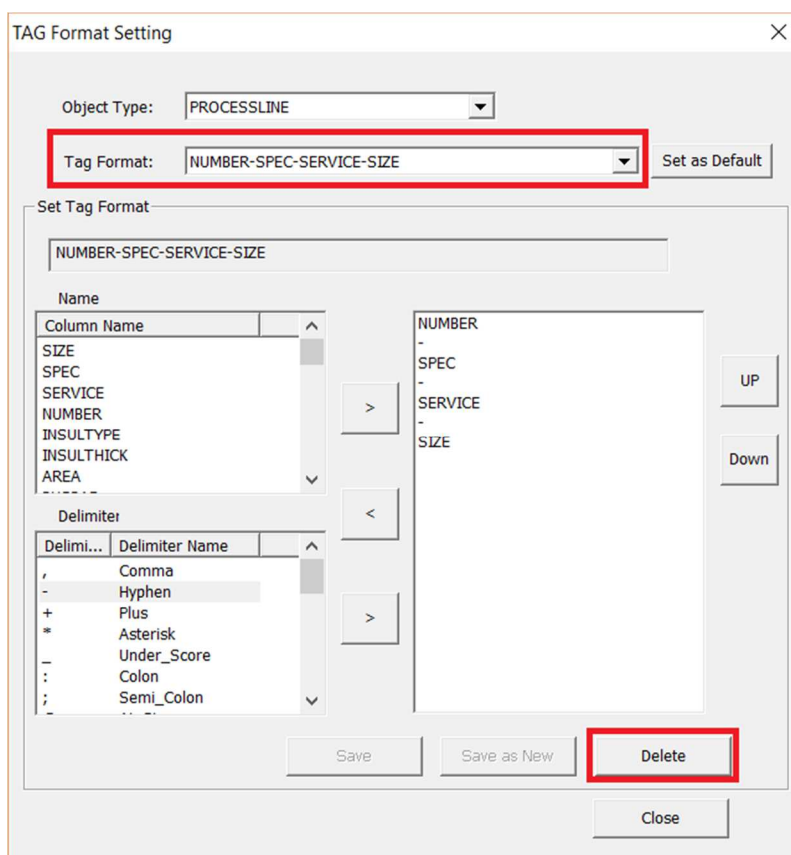
TAG Column Settings

Every project has its own requirements and representations. Sometimes we may have to show some customized annotations or names for some equipment or components. In order to do that, we use TAG column settings.

To access the tag column setting, click on P&ID -> Tools group -> drop down "setting".
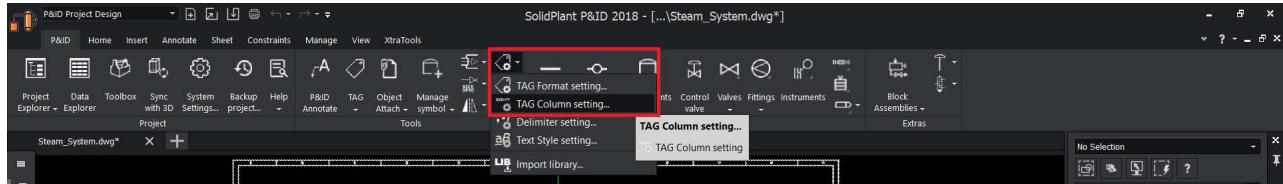
After you click on Tag column setting you will notice a column setting dialogue box pop-up as below.

If you observe carefully, you will notice there is **"PID Object"** at the top of the box.

PID Object: You can select the type of object or category you want to add the customized fields to.

For example: now equipment is selected. If you drop down you will notice different object types that you can modify separately.
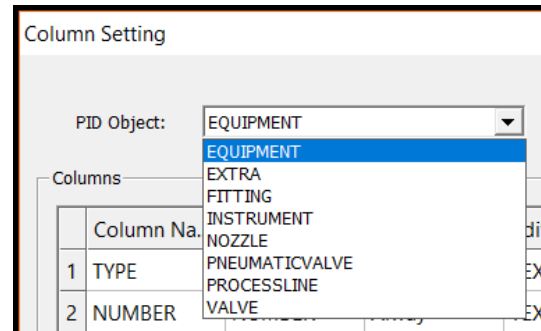
Let's say you want to display "Capacity" for all your equipments. To do that, make sure you select the correct P&ID object, in this case "Equipment".

Then, scroll down until you see "Text01"
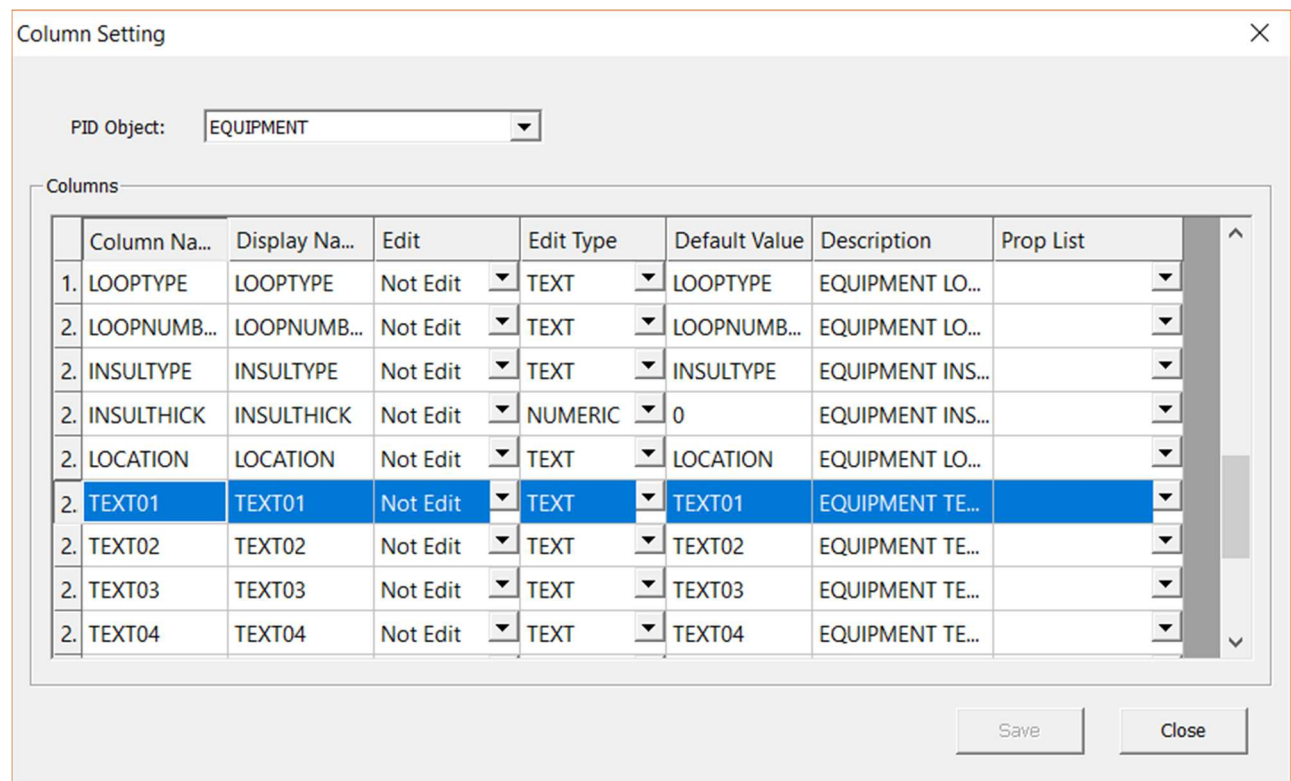
Change the **"Display Name"** as **"Capacity"** and change the "Edit" field to **"Edit"**, then **save** the changes.

This newly added column text will appear in the Assign tag dialogue box when you assign your equipment.

Let's add some customized columns to process line. For example, I want to show Pressure and Temperature for a line.

Change the P&ID object to "Process Line", scroll down to **"Text01"**, double click on Display Name, and change it to **"Temperature"**. Change **"Text02"** to **"Pressure"**. Change the edit field to "Edit" then the Column Setting should look like the picture below, click **save** and Close.
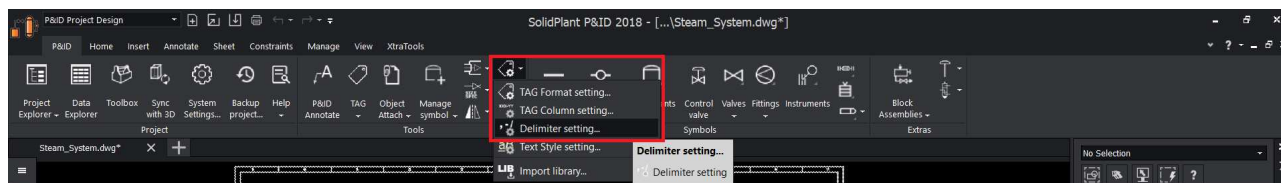
Delimiter Settings

A Delimiter is used to differentiate between two types, like Type-Number for equipment. A delimiter can be any type. Each organization will use different types of delimiters to represent their annotation style. Keeping this in mind we created almost all different types of delimiters in to the database. If any of the custom delimiters user want to create, they can use Delimiter settings.
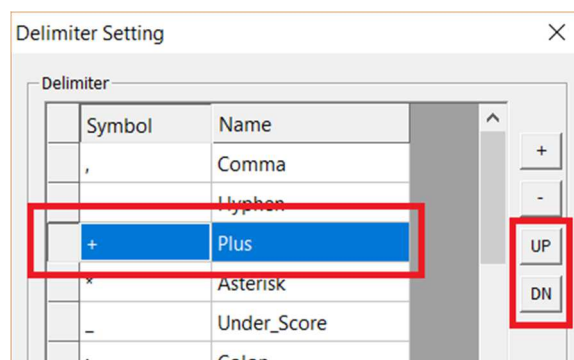
To access the Delimiter settings, click on P&ID -> Tools group -> drop down "setting"


After you click on Delimiter setting you will notice a dialogue box pop-up as below.
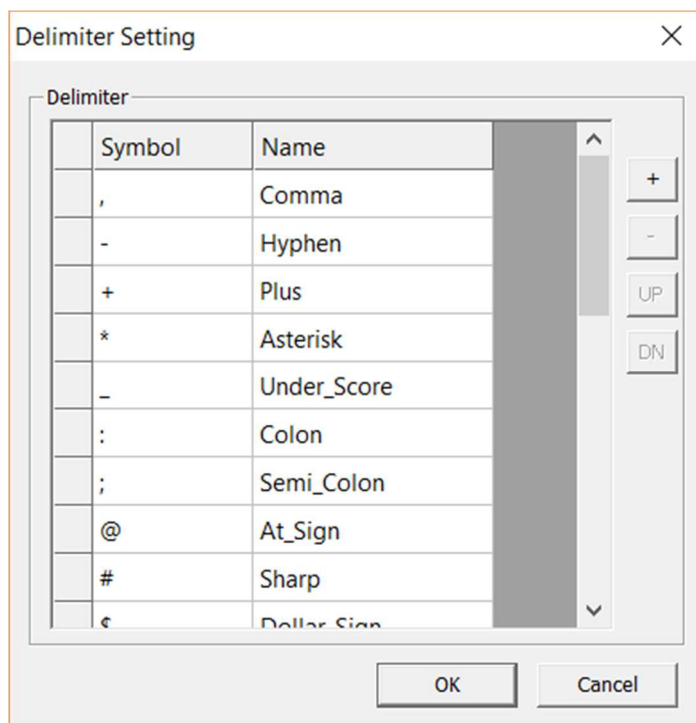
User can add or delete any of the delimiters from the database, or even change the placing of the delimiter using UP/Down button. To change the position you should select the row.

To add a new row, click on the **"+"** button. A new row will be created at the bottom. Type the customized delimiter and click on **"OK"**
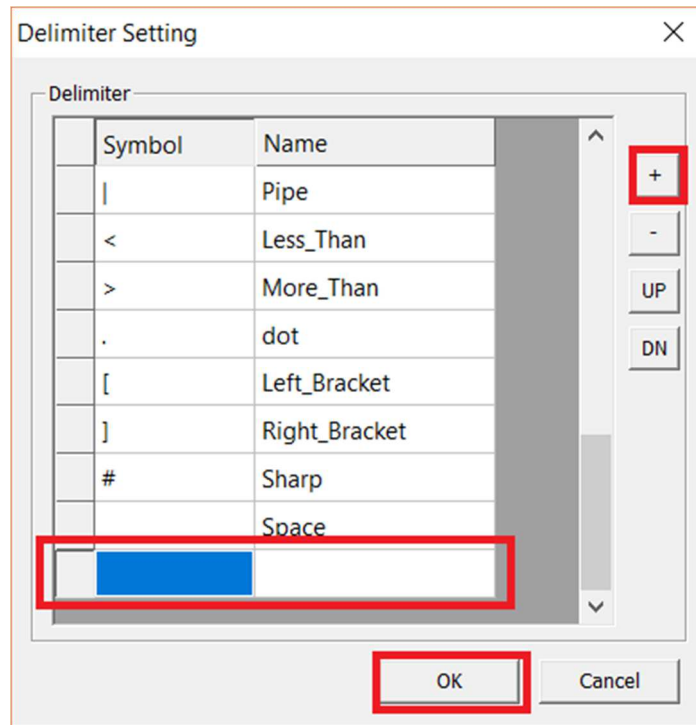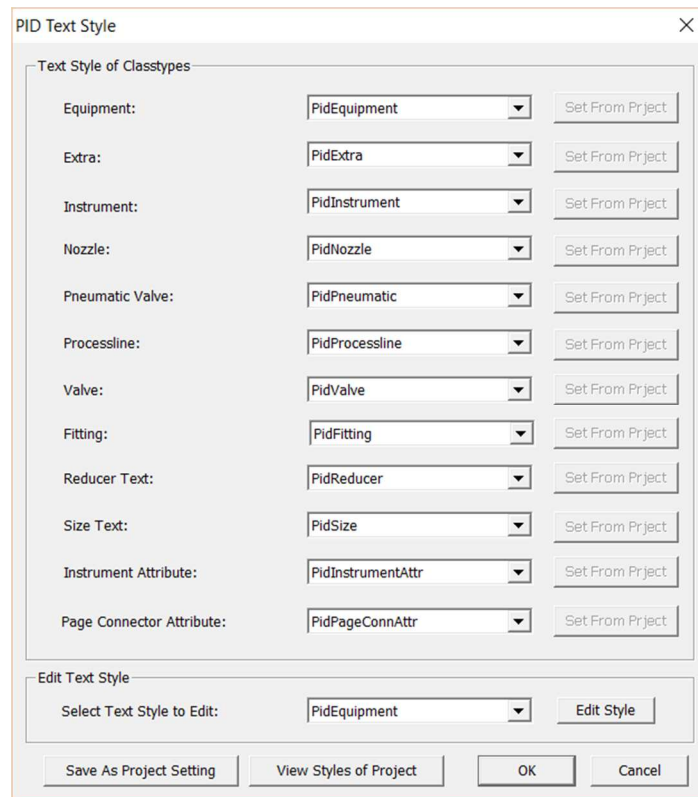

Text Style Settings

SolidPlant P&ID has different text styles for different categories. User can use Text style settings to change or modify the font style, text height and many more.
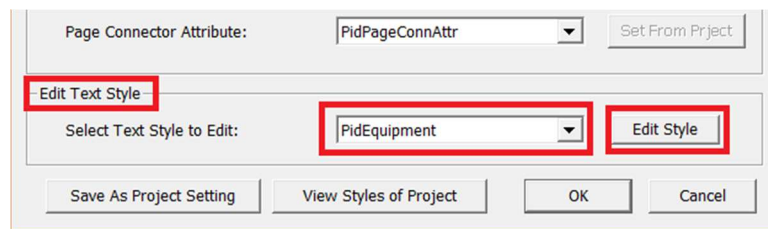
To access the Text style setting, click on P&ID -> Tools group -> drop down "setting"
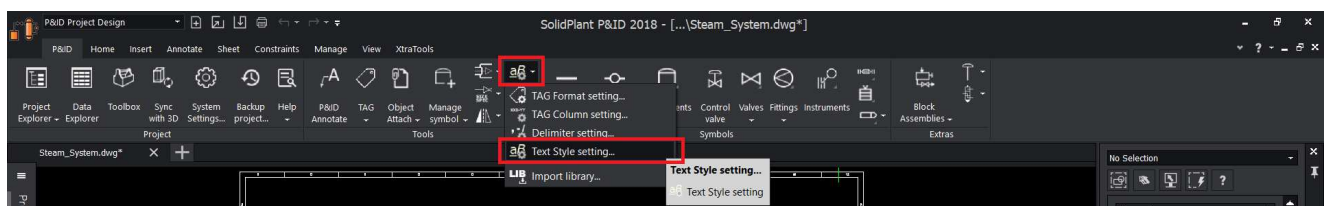
After you click on Delimiter setting you will notice a dialogue box pop-up as below.
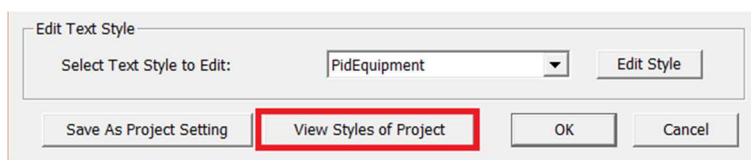
As you see from the above picture each type has its own text style. To edit any of the text styles, select the style in the 'Edit Text Style' and click on **"Edit Style"** button.
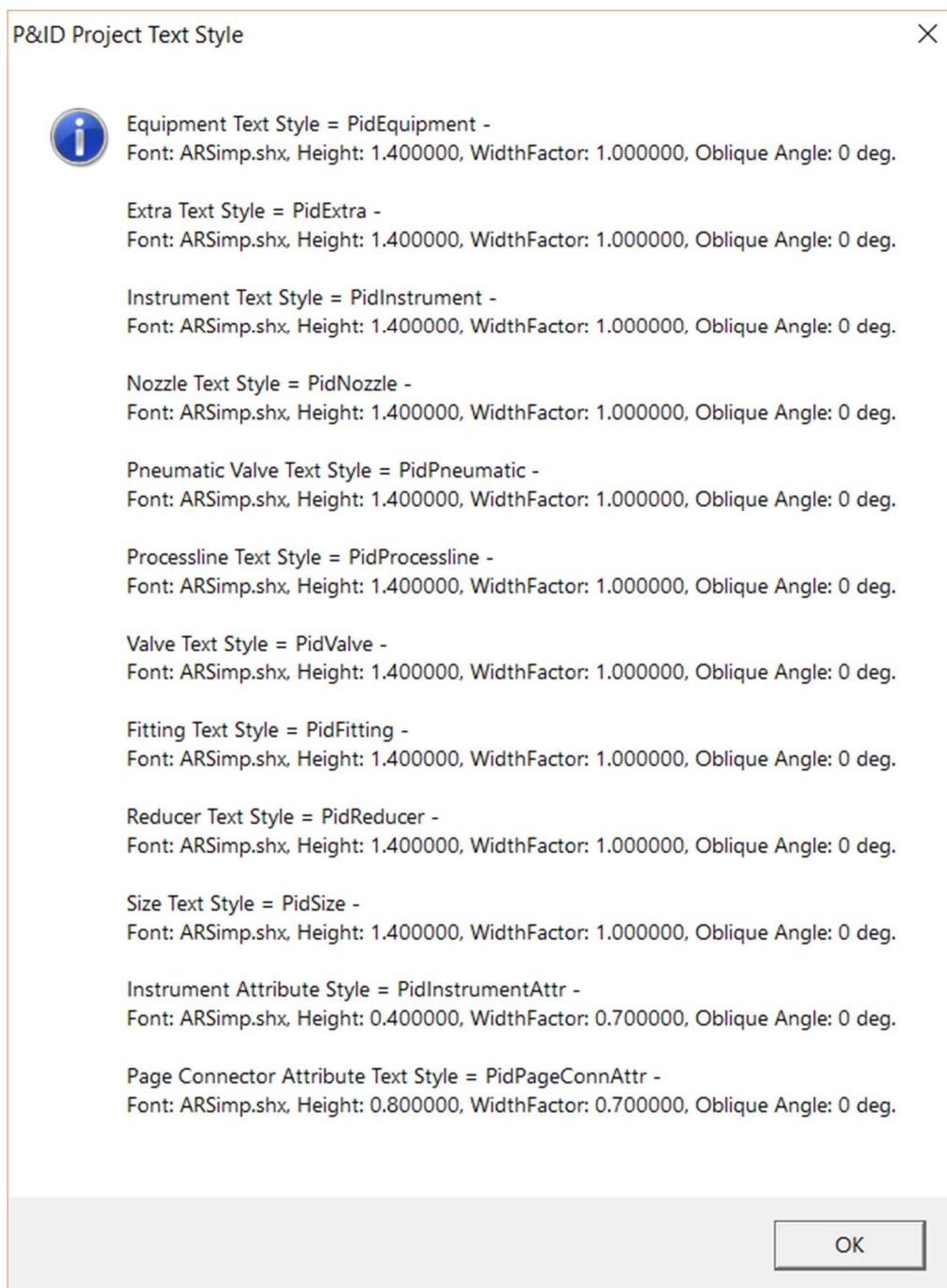

A drafting styles dialogue box will open where you can modify/change font, height of the text and orientation. After you select your desired font and text height click on "OK"
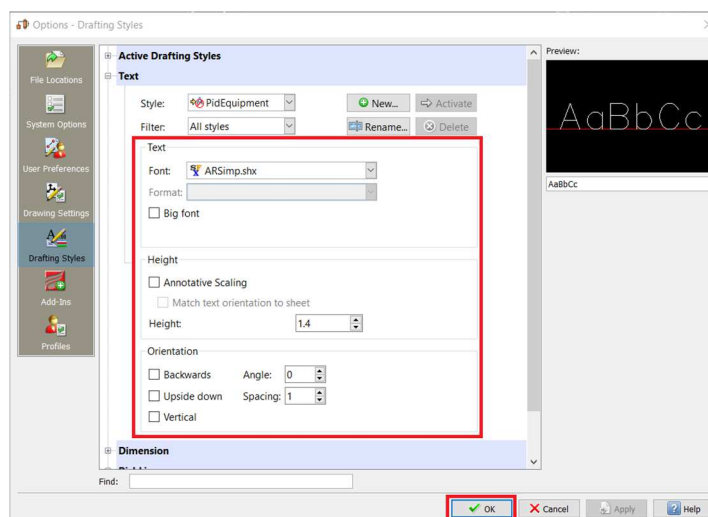
To view all the styles of the project click on the **"View Styles of Project"** button

Edit Text Style

Select Text Style to Edit: PidEquipment ▼ Edit Style

Save As Project Setting | View Styles of Project | OK | Cancel

Then a list of styles will appear same as below

P&ID Project Text Style ✕

ⓘ Equipment Text Style = PidEquipment -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Extra Text Style = PidExtra -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Instrument Text Style = PidInstrument -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Nozzle Text Style = PidNozzle -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Pneumatic Valve Text Style = PidPneumatic -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Processline Text Style = PidProcessline -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Valve Text Style = PidValve -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Fitting Text Style = PidFitting -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Reducer Text Style = PidReducer -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Size Text Style = PidSize -
Font: ARSimp.shx, Height: 1.400000, WidthFactor: 1.000000, Oblique Angle: 0 deg.

Instrument Attribute Style = PidInstrumentAttr -
Font: ARSimp.shx, Height: 0.400000, WidthFactor: 0.700000, Oblique Angle: 0 deg.

Page Connector Attribute Text Style = PidPageConnAttr -
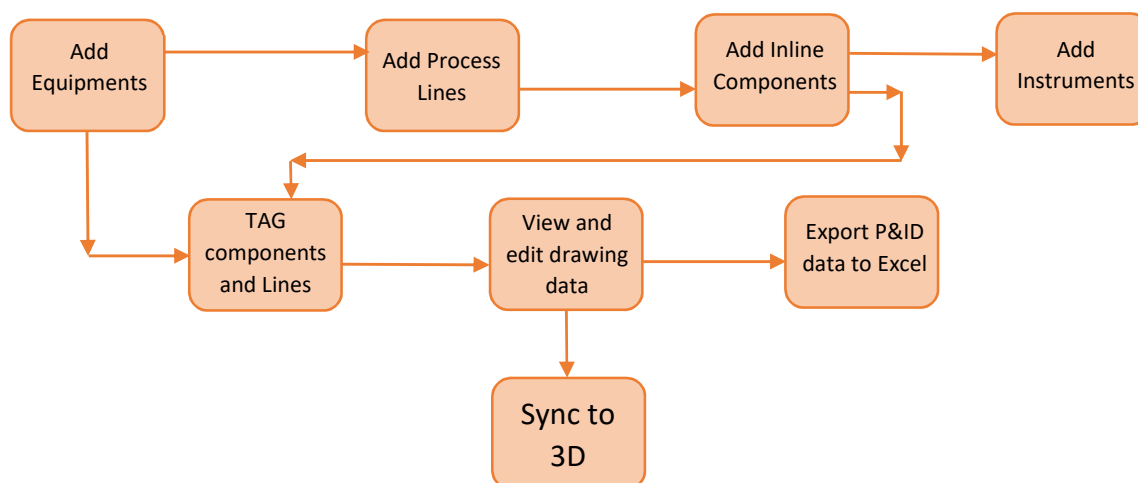Font: ARSimp.shx, Height: 0.800000, WidthFactor: 0.700000, Oblique Angle: 0 deg.

OK

Design a P&ID Drawing   3

User can easily create dynamic schematic drawings. SolidPlant P&ID provides numerous components and lines that you can place in your drawings.

Components and lines contain data that links to the Data Manager, where you can view reports, export the data, and import changed data back into the program.

The following workflow describes a way to design your P&ID drawings using the standard symbols.

Add Equipments → Add Process Lines → Add Inline Components → Add Instruments

TAG components and Lines → View and edit drawing data → Export P&ID data to Excel

Sync to 3D

Working on P&ID drawing

Add Equipments

SolidPlant P&ID gives the user great flexibility to add equipment which helps them to work faster and smarter.

To add equipments in the drawing, click on the Tool box function in the P&ID tool palette or click on the floating tool box menu on left side.
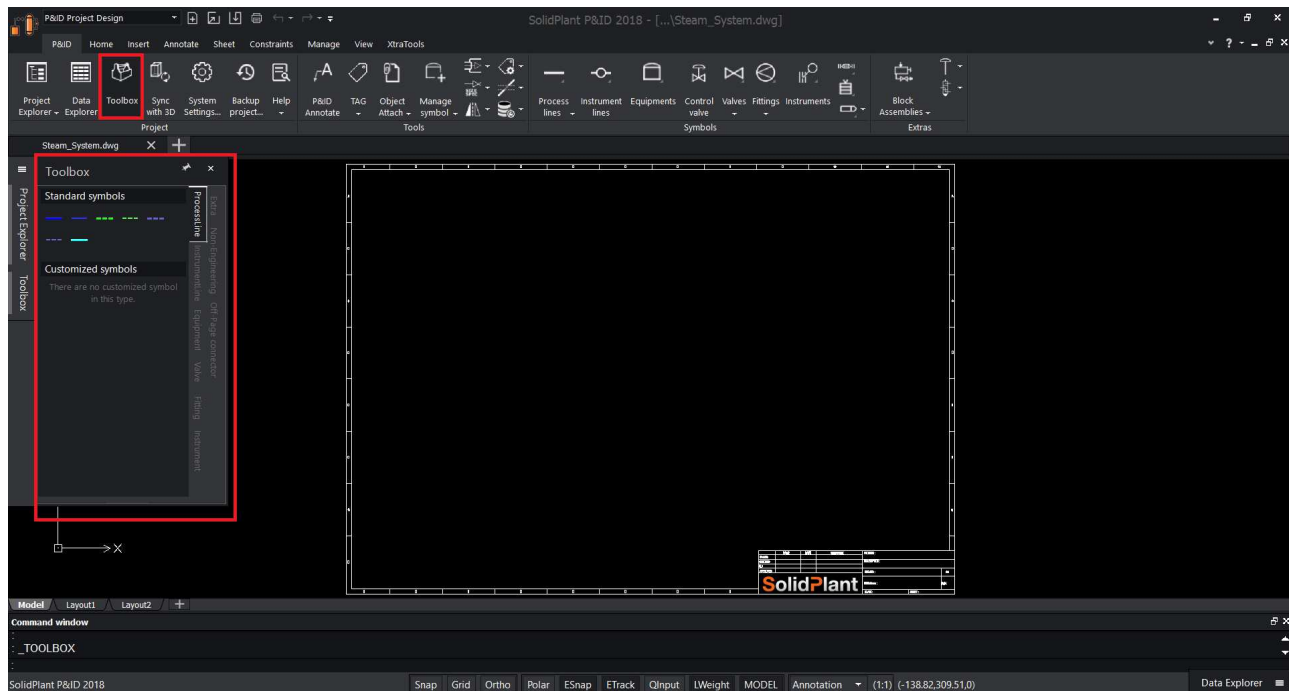
Click on equipment tab in tool box
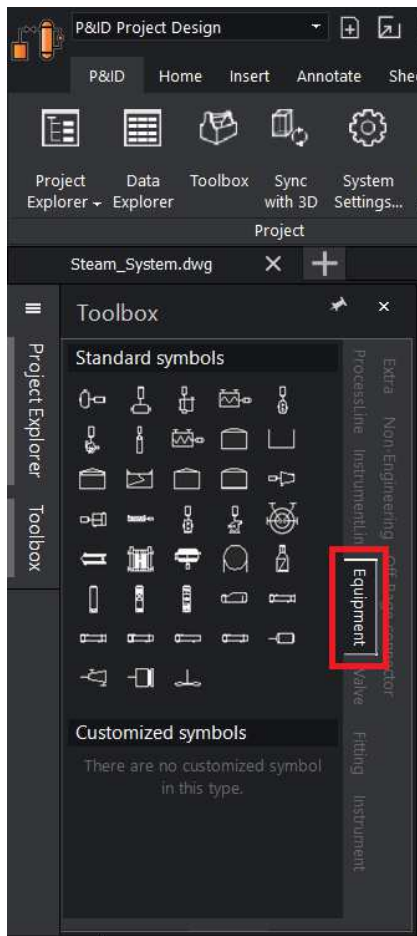
To place an equipment symbol in the drawing, select the symbol in the tool box and place anywhere in the drawing. Symbols can be scaled at the time of placing.

Select Dome Roof tank in the tool box.
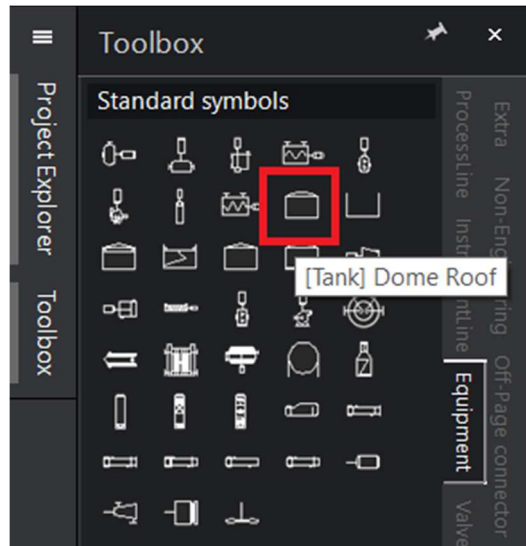
Add in the drawing.
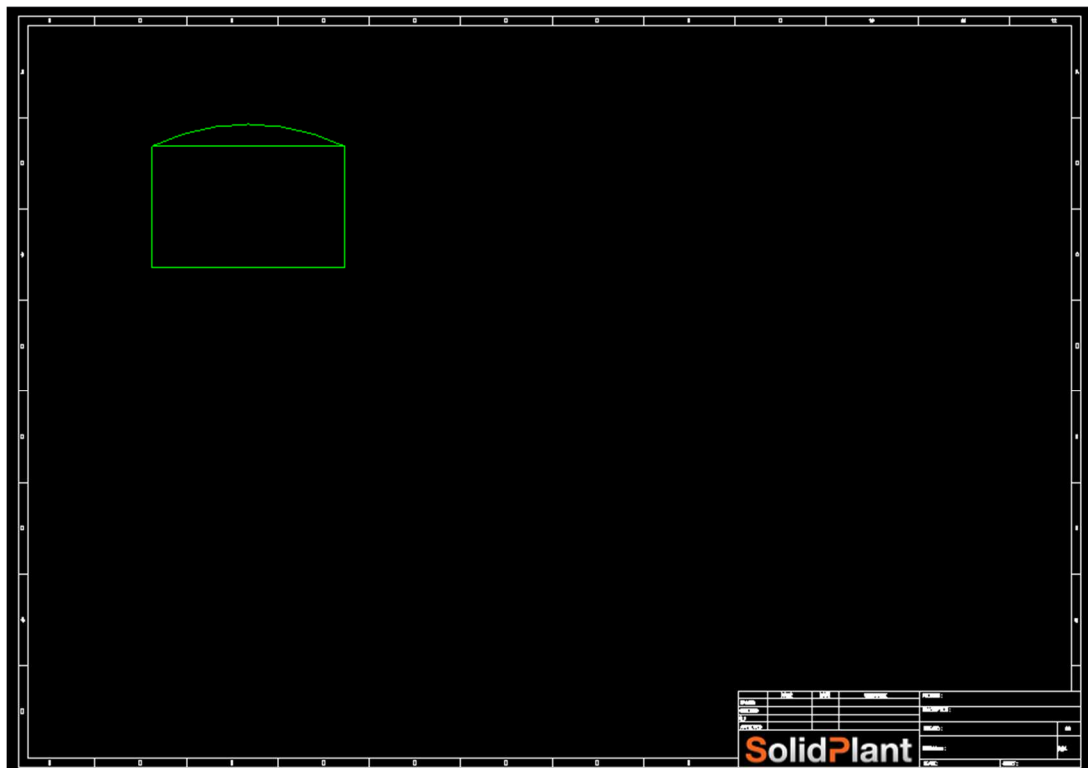
To move an already placed equipment from one location to another, select the equipment symbol, you will see a blue dot at the bottom corner. Pick the blue dot and place at the location where you want to move.
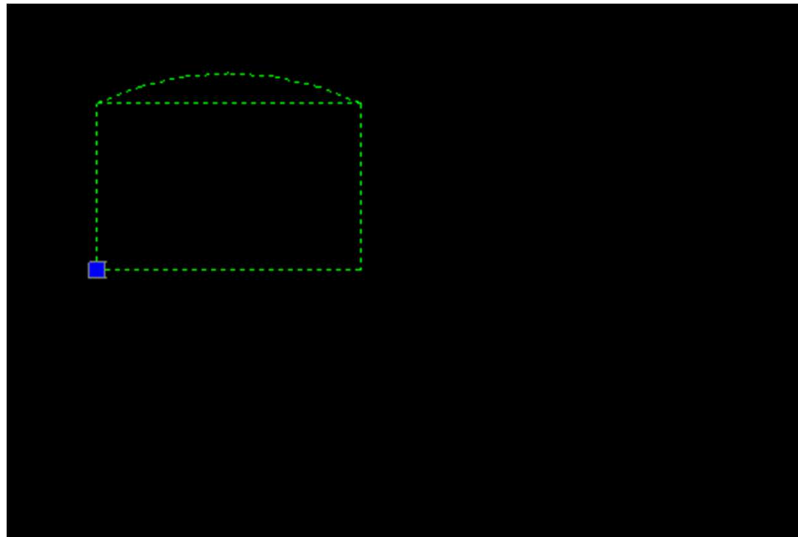
Now add a horizontal centrifugal pump and a spiral exchanger. User can use basic commands like "copy" to make multiple copies of the equipment.
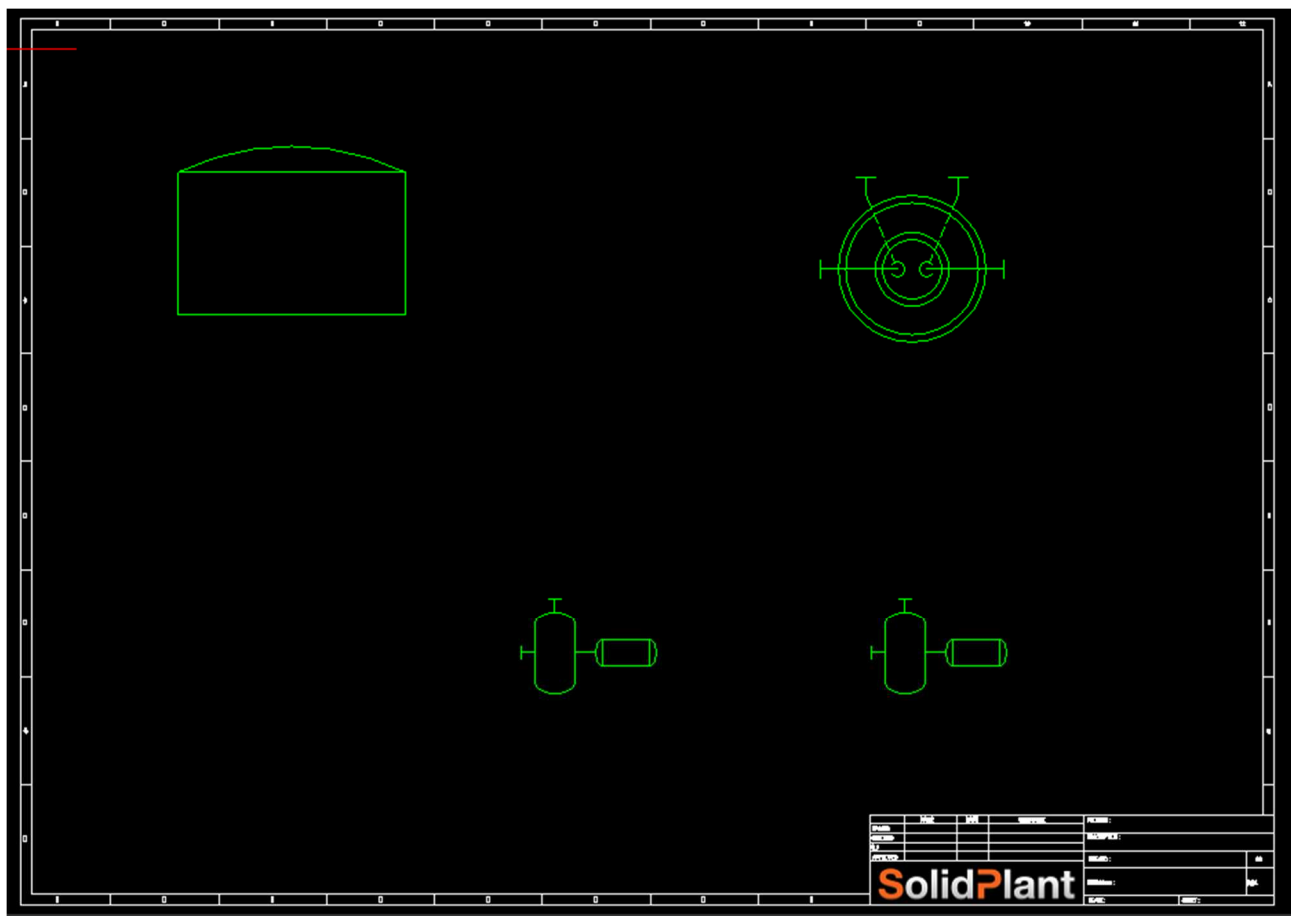
Tag can be assigned at this point, if you want to start tagging for your equipment please refer to Assign TAG topic in the below pages.

Process Lines

Process Line shows the direction of flow and also the Process involved in the system.

SolidPlant P&ID has **Dynamic Process Lines** which means; Lines and components are dynamic with SolidPlant P&ID. Reduce manual breaking and mending of lines with intuitive grip editing and manipulation. Create, move, and snap lines into equipment. Lines automatically break, maintain flow direction, and attach to components that are inserted on, or attached to, the line. When a component is removed, lines mend automatically. Quickly move and snap components with dynamically linked properties and information in place without the burden of manually editing underlying data.

Process line Options

Before we create any process line in the drawing let's have a look at the few "Options" for Process line. To access options click on the process line in the P&ID tool palette.
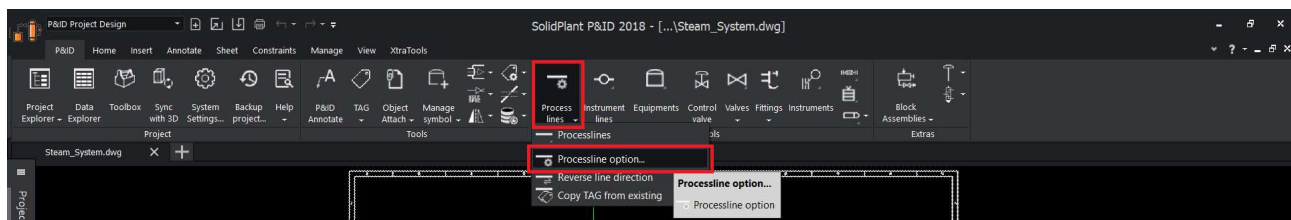
Process line options dialogue box will appear
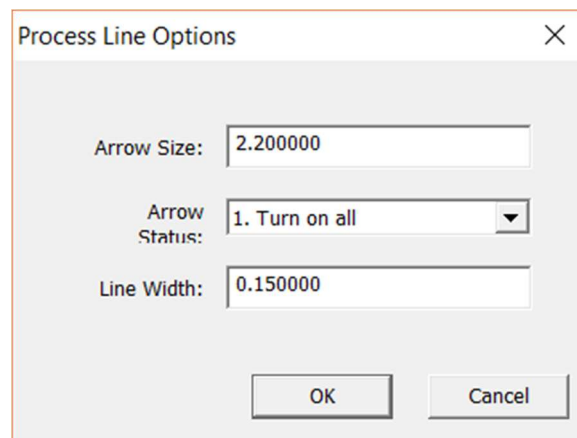
- Arrow size: The size of the arrow at the end of the line segment
- Arrow Status: we have 3 different arrow status in SolidPlant P&ID. User can choose whatever is suitable for his project.
- Line width: The width of the line segment.

SolidPlant P&ID
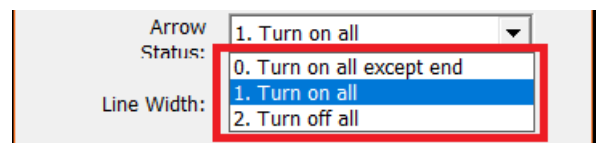
Create Process Lines

Select the Primary Line from the ProcessLine tab in the ToolBox
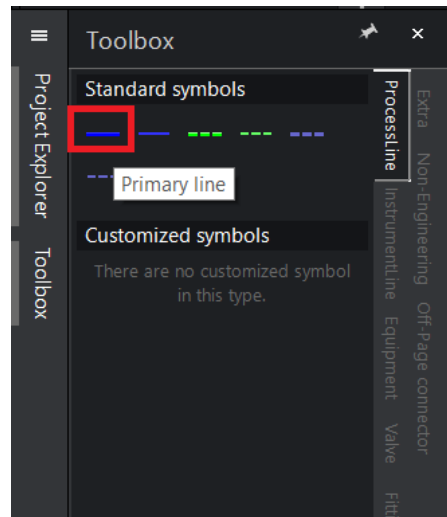
Start the process line from the side of the Tank to the suction of the Pump.
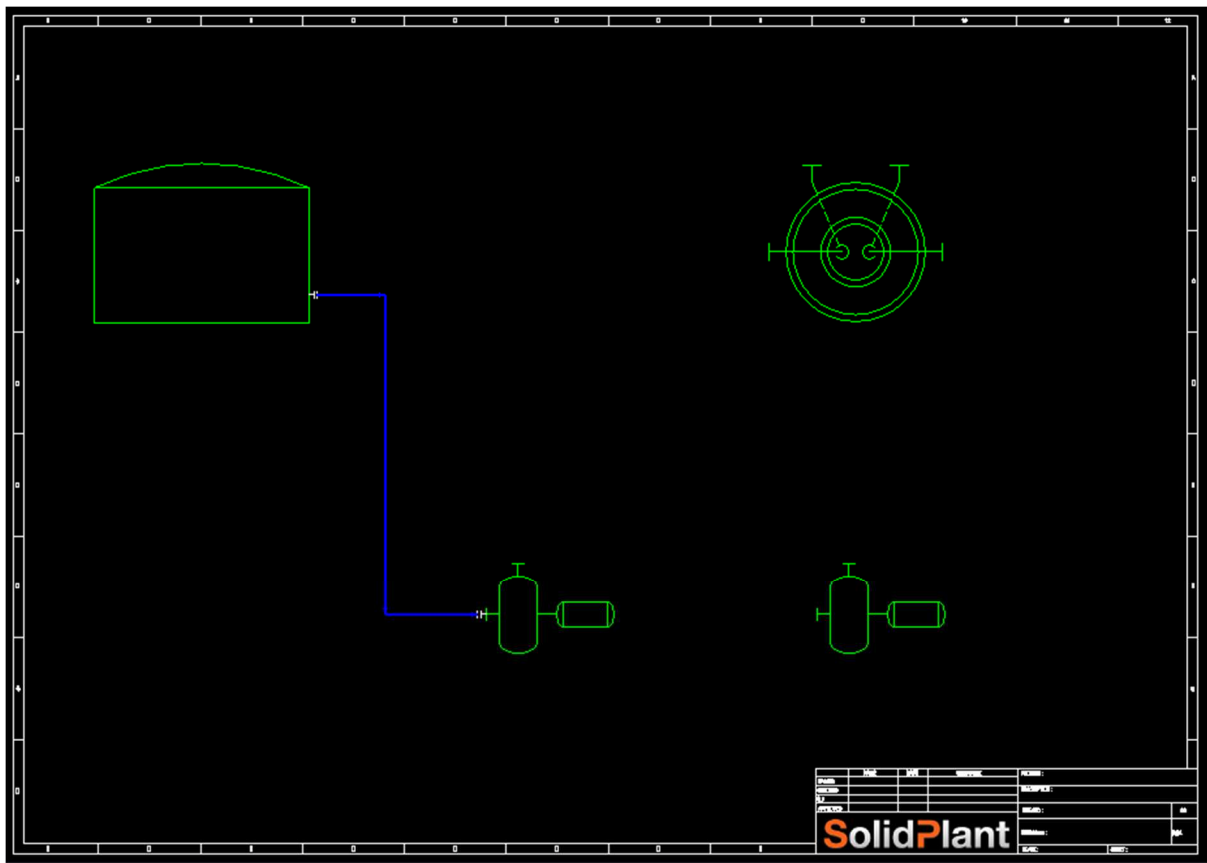
A nozzle will be created automatically from the equipment when you create a process line.
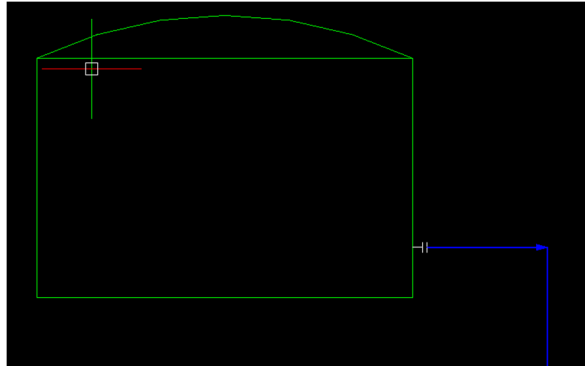
💡Tip: As all the process lines are dynamic in SolidPlant, if you move an equipment the connected process lines will also move, along with inline components.

Select the primary line again and start a branch from the Main suction line to the second pump.

SolidPlant P&ID is a smart application. Whenever you create a branch from the main line the application prompts you whether you want to use the same Tag for the branch line or you want to assign a different tag as shown in below picture:
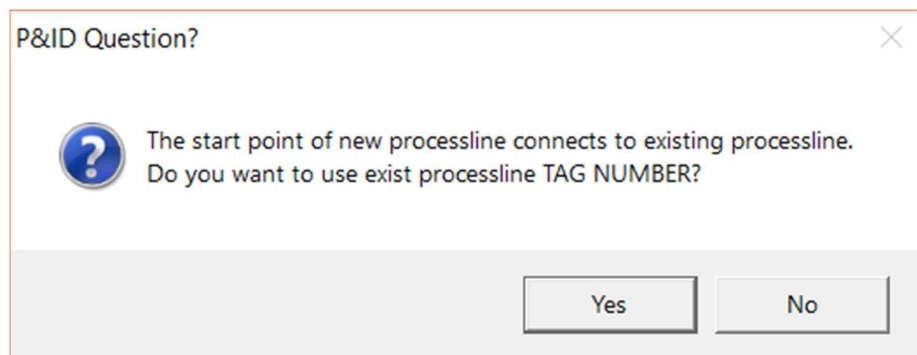
If you want to continue with the same tag click "Yes" or if you want to assign a different tag for the branch line click "No".

In this case use YES, because I want to connect two pumps suction with one header.

The Process line should be drawn as shown below:
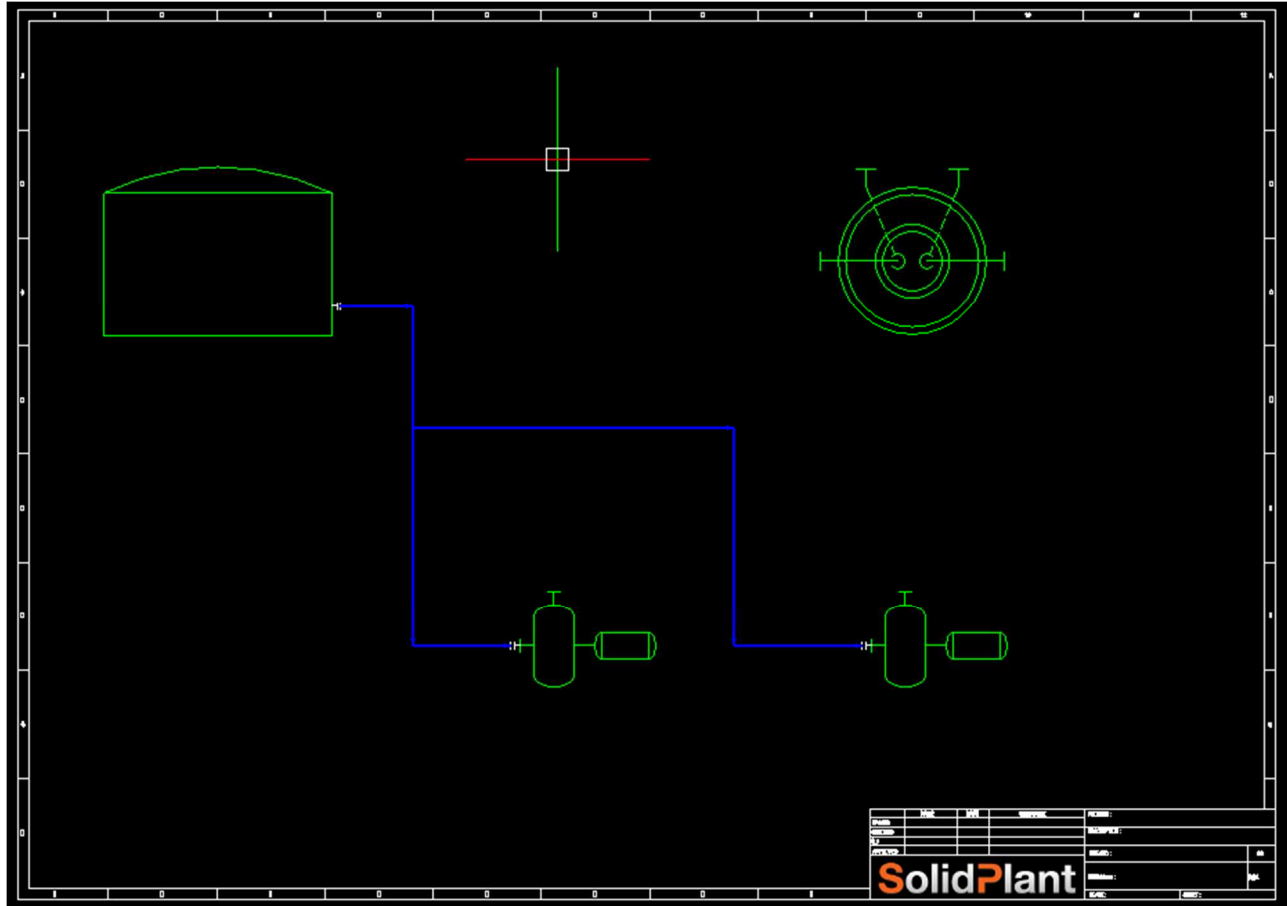
Change Nozzle

If you look carefully at the nozzles of the pumps, the default pump template already has a nozzle. Still, because of the dynamic process line, an auto nozzle is created. To change this auto nozzle, click on the "Fittings" in P&ID tool palette and select "Change Nozzle" function.
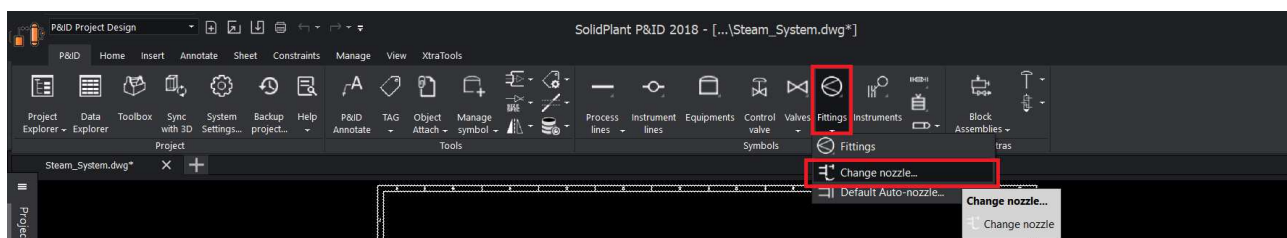
Now click on the auto nozzle. "Select Nozzle" dialogue box will appear same as below.
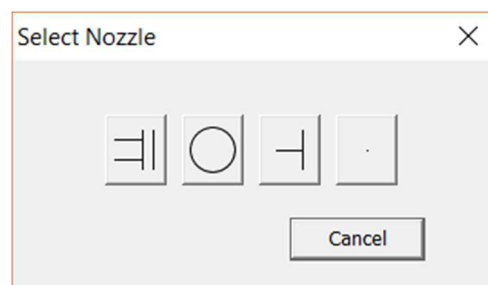
From the select nozzle dialogue select the assumed nozzle "." to replace with the flanged nozzle.

Tip: There are two ways to change the nozzle. Either you select the nozzle first and click on the change nozzle function, or select change nozzle function first then click on the desired nozzle to change.

Default Auto-Nozzle

A nozzle will be created automatically at the time of creating a process line. Default auto-nozzle in every project is **"Flanged Nozzle"**. If user has a specific requirement and wants to change this auto nozzle they can use **"Default Auto-Nozzle"** function.

To access default auto-nozzle click on Fittings drop down in the P&ID tool palette and select "Default Auto-Nozzle"
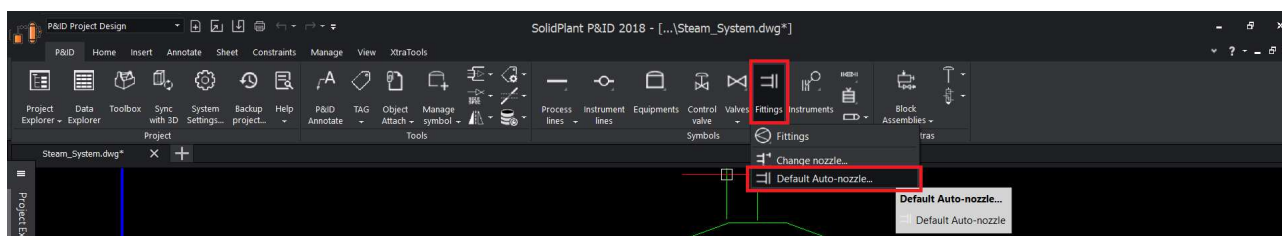
Set default Auto-Nozzle dialogue box will appear. User can select which nozzle type they want to make as default from the drop down and click on "OK".
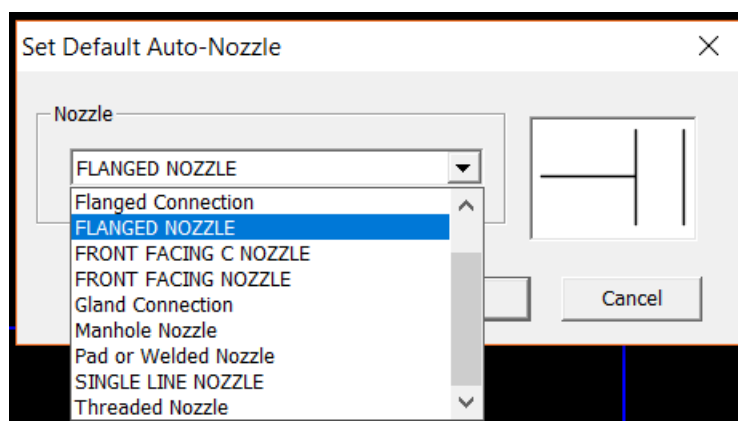
Place Inline Components

Inline Components play a very important role in Plant designing. Components are of different types. For example Valves, Reducers, Flanges, Strainers.

Components in SolidPlant P&ID are dynamic and reflect the direction of flow. In the library we have all the symbols of the components which are commonly used in Plant design. Components in SolidPlant P&ID are categorized in to 2 major types.

- Valve
- Fitting

To access valves, click on the valves tab in the tool box.
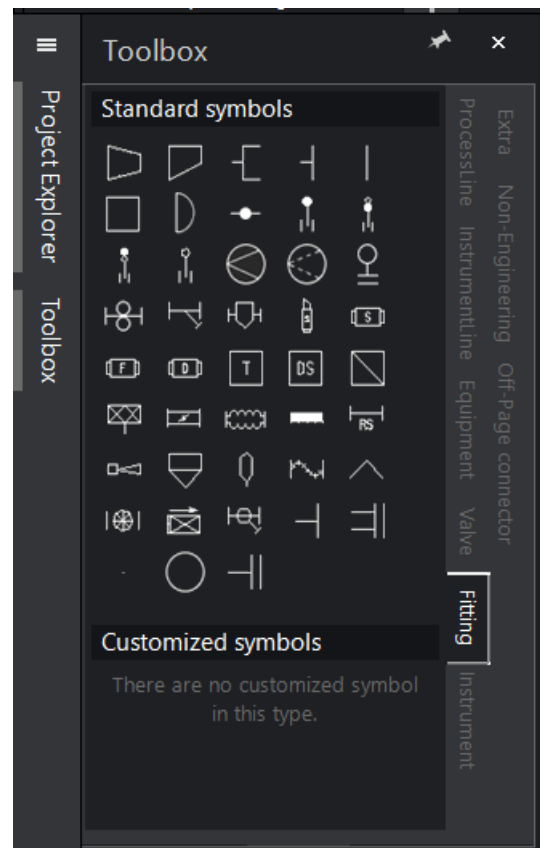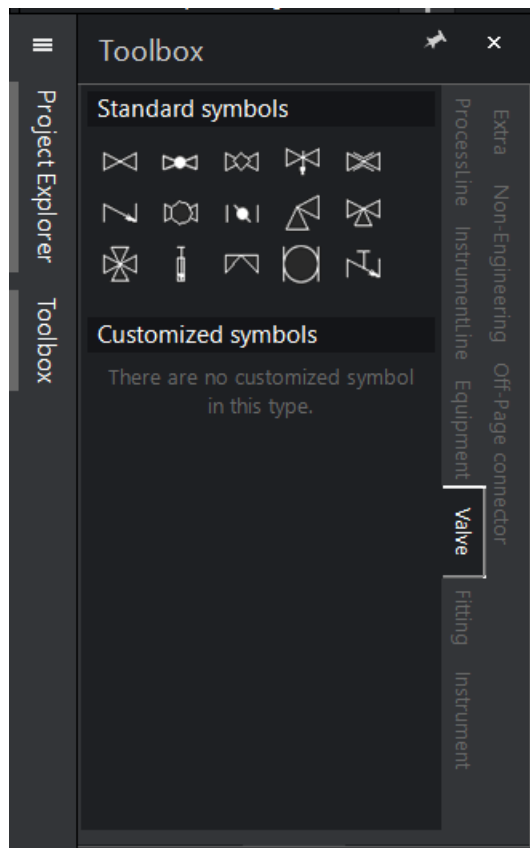
Add Valves in the Drawing

Valves will be snapped to the process line. We will place some valves. Select Globe valve and place at the outlet of the tank, suction of the Pump, discharge of the pumps and inlet of the spiral exchanger. You will notice the components will flip automatically with respect to the direction of the flow, and also horizontally and vertically. User can place different types of valves based on the project requirements.

The Valves can be placed as shown in the picture:
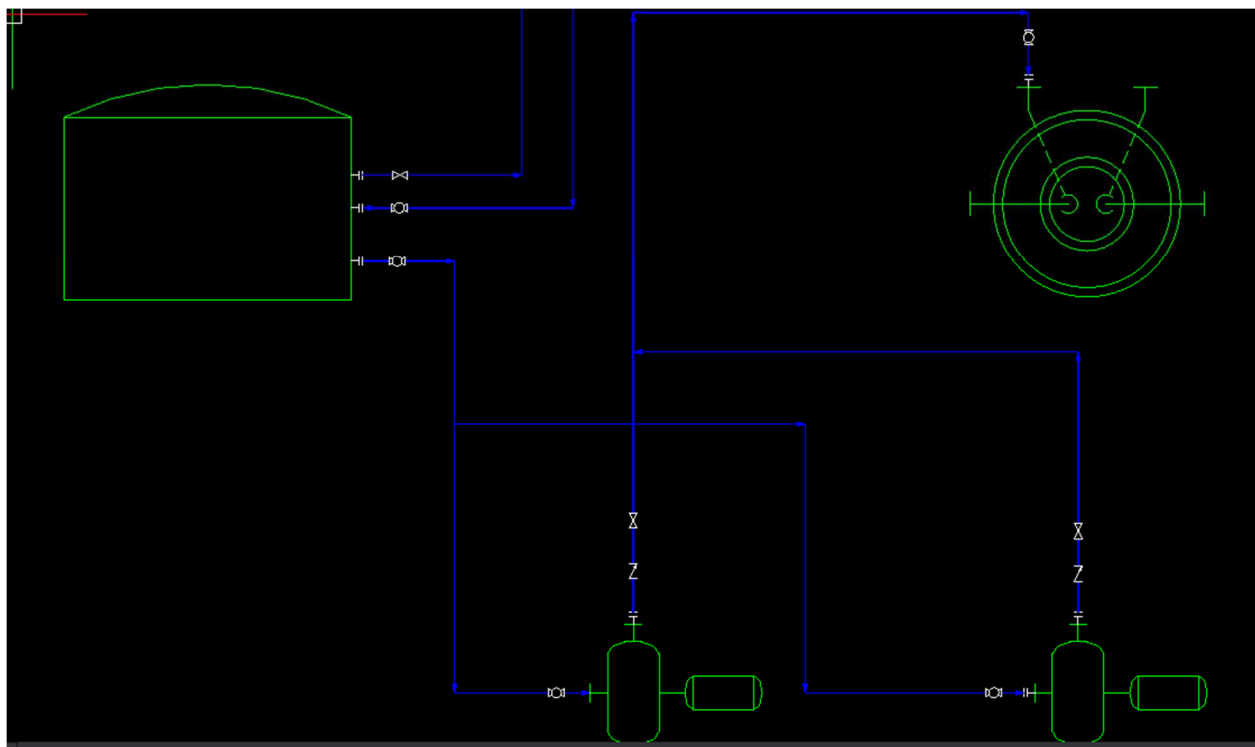
💡 Tip: You can place a valve multiple times until you exit the function or hit Esc button

Change Valve

Especially P&IDs will get revised multiple times depending on the site or clients requirements. SolidPlant P&ID gives user the flexibility to change the valve type into a different one with just one single function.

Drop down valves function on the P&ID ribbon -> Change Valve
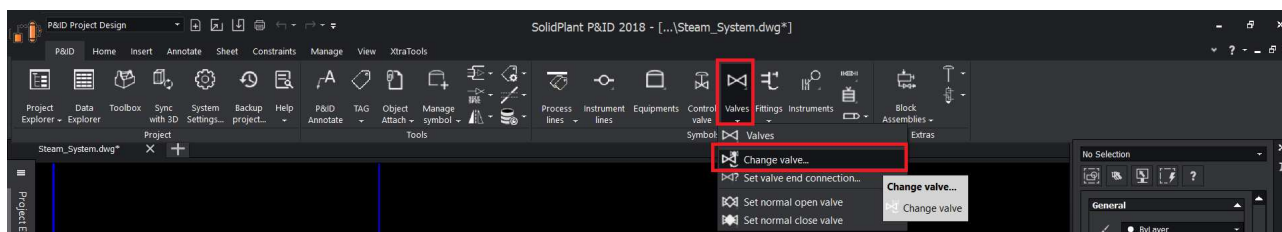
Select the valve to change. A 'change valve' dialogue box will appear. You can see all different types of valves and their previews on the right side when you select them.

Select the valve and click on "OK". The existing valve will change to the newly selected type.
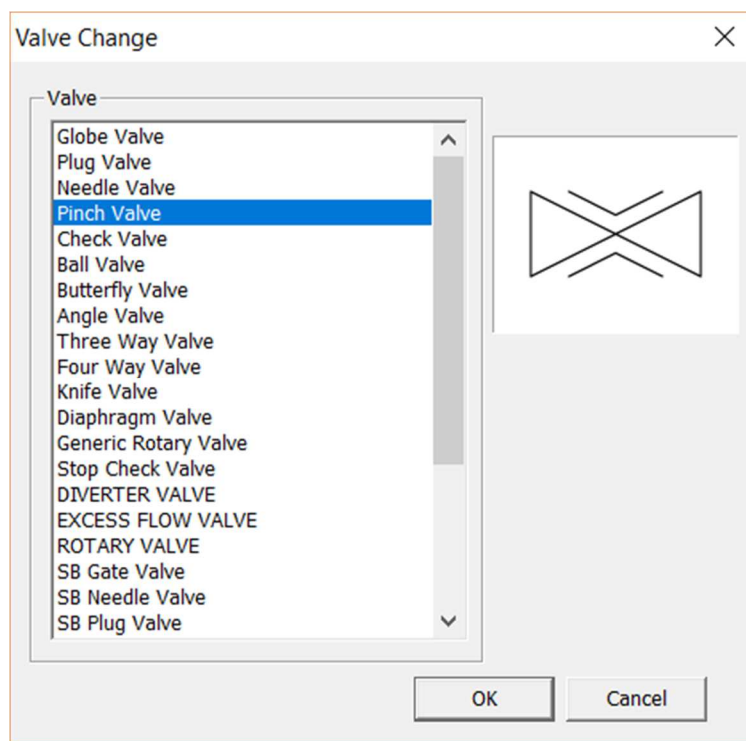
Add Fitting

Fittings come in many types, and can be placed in the drawing quite easily. Just select one from the toolbox and drop it on the process line.

Select a concentric reducer from fitting toolbox and place on the line same as below picture.
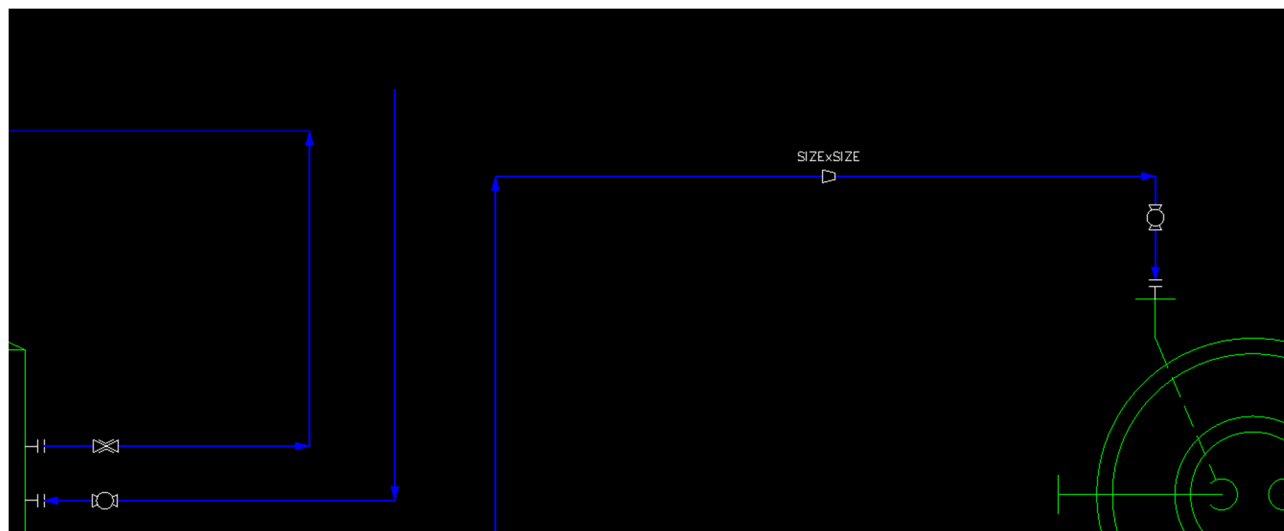
💡 Tip: Reducer flips according to the size of the main line and run line.

Assign TAG   4

Easily create, edit, and customize tags and annotations in industry-standard formats. Simply click on the Equipments, lines or components, and select the assign tag feature to manage the tag.

SolidPlant P&ID maintains a register of unique tag numbers, whether in internal mode or a project environment. The system automatically alerts you when duplicate tag numbers are encountered and prompts you an information box.

Let's see how we assign tags in SolidPlant P&ID:

Click on the Assign TAG button on the P&ID ribbon.
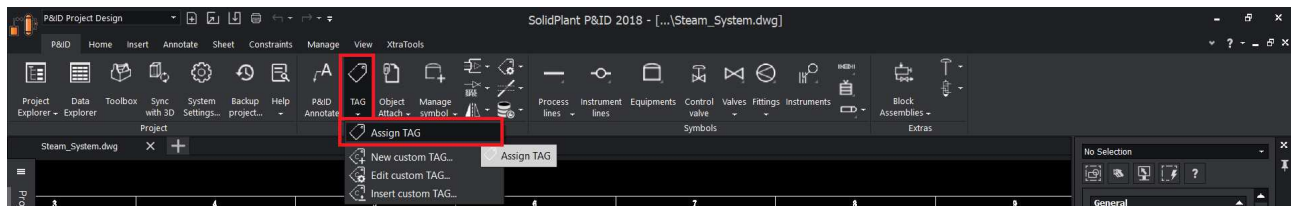
Then select which component or equipment you want to assign.

Assign Equipment TAG

To assign equipment, select the assign tag function and click on the boundary of the equipment symbol. 'Assign Tag' dialogue box will appear.
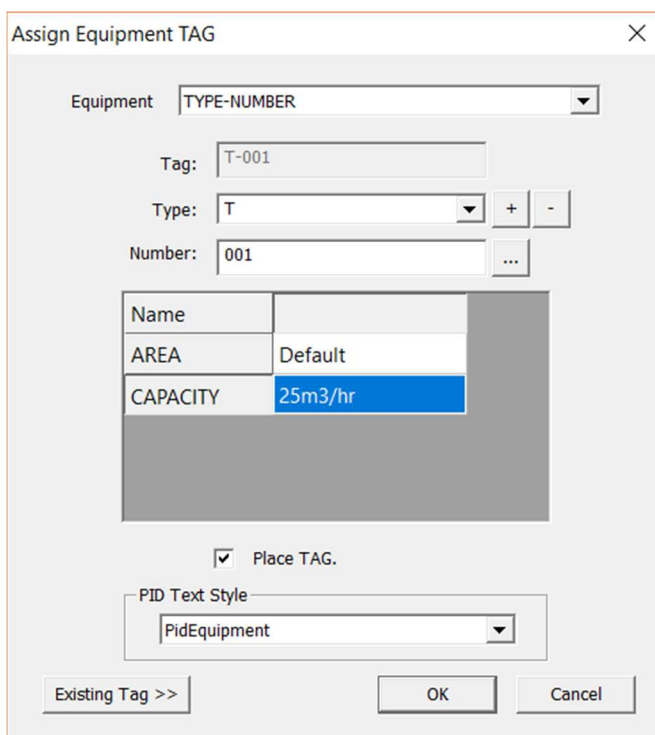
(i).   Annotation Style: The style of the annotation user wants to display the tags for equipments. If you drop down you can see the custom annotation styles which user created earlier using **tag format settings**.

(ii).   Tag Preview: previews the tag format which is going to be placed in the drawing.

(iii). Type of equipment: displays the different type of equipment based on the category that user selected. Example: T for tank, P for pump etc...

(iv).   Tag number: number is automatic and start from 001 based on the placement order. Running numbers will be created depending on the type of equipment. Automatic number contains # in front of the number. To set that as tag number, click on [...] button.

(v).   Custom fields: this is the place where all the custom tags will be displayed. Custom tags are created using **Column format settings**.

(vi).   Place Tag: check box to display or hide the tag for equipment.

(vii). Text style: displays the current text style selected.

Now click on the [...] button to display our tank tag as "T-001" and enter capacity 25m3/hr. and click on "OK"

Tags in the drawing can be placed anywhere nearby to the equipment depending on requirements. Tags for equipment have an option to "Double Tag", that means the tag can be placed twice. One we place near to the equipment and another one we place at the top most part of the drawing (to display the custom properties of the equipment).
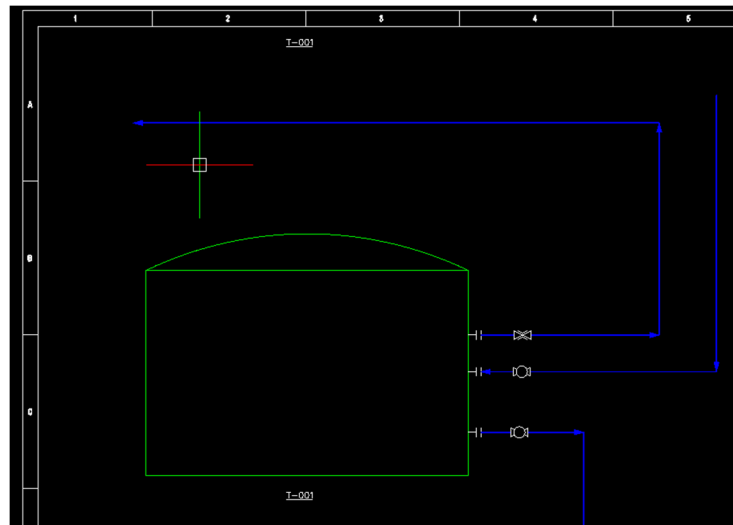
Double tag can also be de-activated and the underline can be removed using "Edit symbol" function under Mange Symbol.

Refer to 'Manage symbol' topic in Advanced features chapter.

Assign all the equipments same as below.
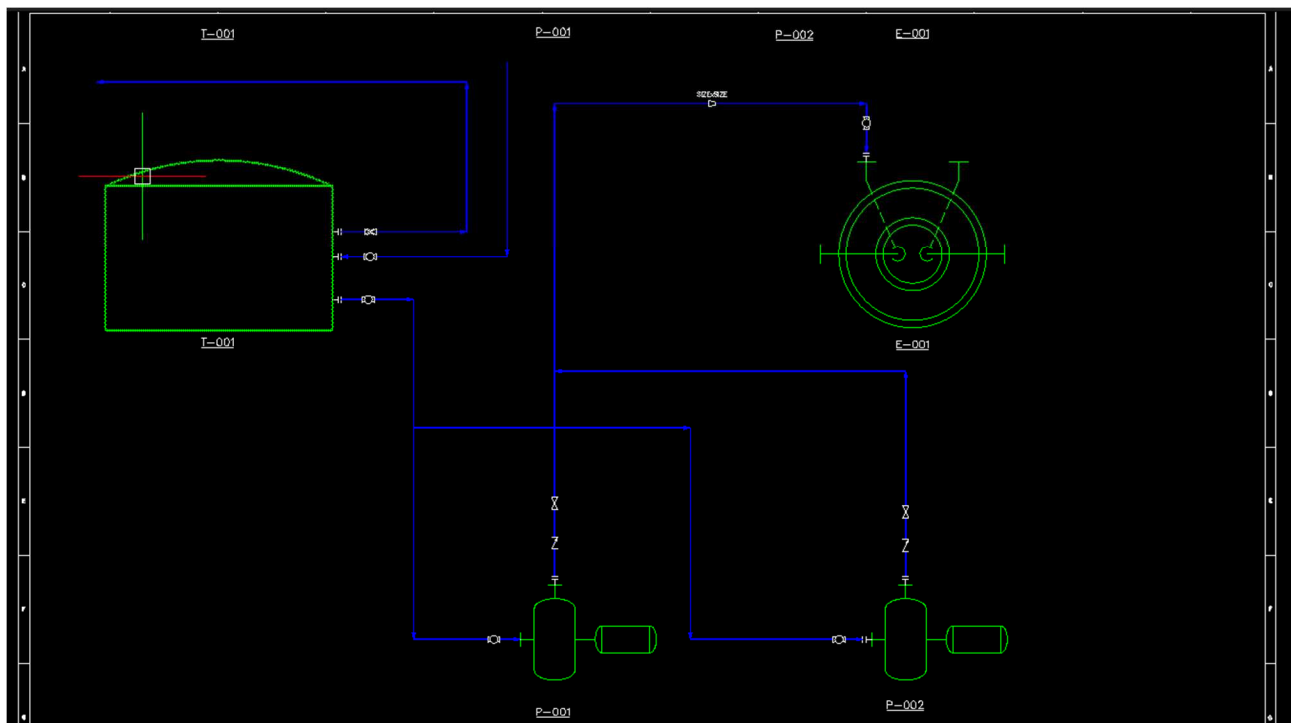
Assign Process Lines

To assign process lines, select the assign tag function and click on the line. Assign Tag dialogue box will appear.

(i). Annotation Style: The style of the annotation user wants to display the tags for process lines. If you drop down you can see the custom annotation styles which user created earlier, using **tag format settings**.

(ii). Tag Preview: previews the tag format which is going to be placed in the drawing.

(iii). Size: displays the size of the line/pipe to be used in process.

(iv). Spec: displays the Specification of the line/pipe to be used in process.

(v). Service: displays the service of the line/pipe to be used in process.

(vi). Tag number: number is automated and starts from 001, based on the placement order. Automatic number contains # in front of the number. To set that as tag number, click on ⬚ button.

(vii). Custom fields: this is the place where all the custom tags will be displayed. Custom tags are created using **Column format settings**.

(viii). Place Tag: check box to display or hide the tag for equipment.

(ix). Copy settings: check box to copy the data to connecting branch lines.

(x). Text style: displays the current text style selected.

Now drop down the 'size' field and select 6" from the list. Type SP01 as our specification and click on + button to add into the database. Select the service from the 'service' drop down list (selected FO-Fuel Oil), click on the ⬚ button to make our tag number unique and click on "OK".
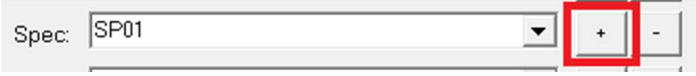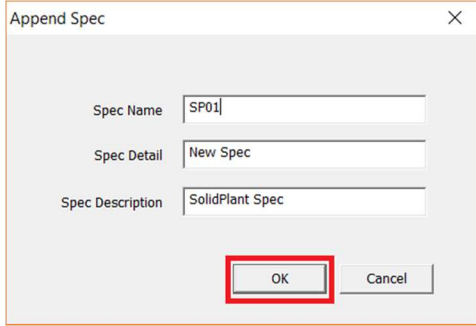
Adding Spec to the list

User can add any custom details to the assign tag dialogue of the process line, such as new size, new spec and new service. To add new spec, type the spec name and click on the "+" button in the spec field

Append spec dialogue box will appear. Add spec detail and description if available and click on "OK".

The information will be displayed, saying spec is added into the list. Newly added spec will be displayed at the bottom of the list when you assign your process line later.
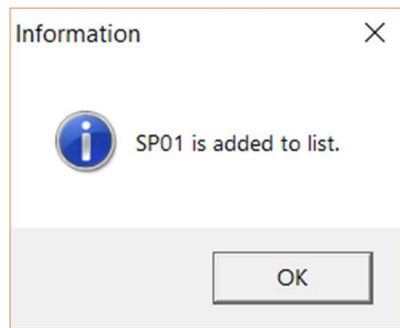
Tip: Using "-" button you can also delete any of the unrequired size, spec or service.

Place the Tag in the drawing just outside the line.
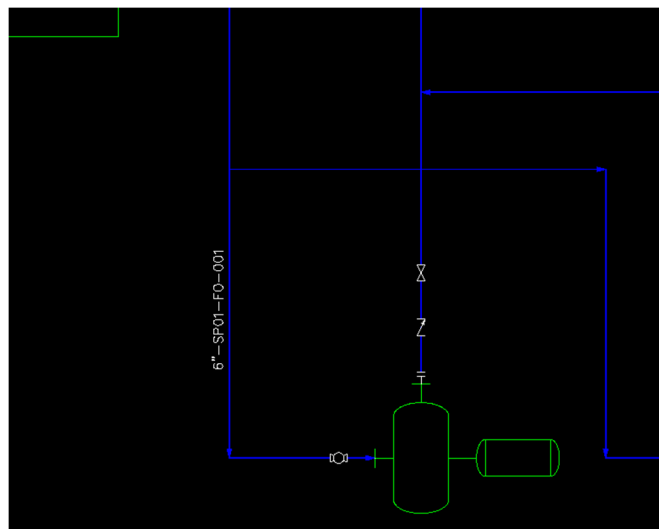
When you assign tags for a branch line, all the data will be copied except size. Size can be selected manually from the drop down, as branch sizes can be different from the main size.

Assign all the process lines same as below.
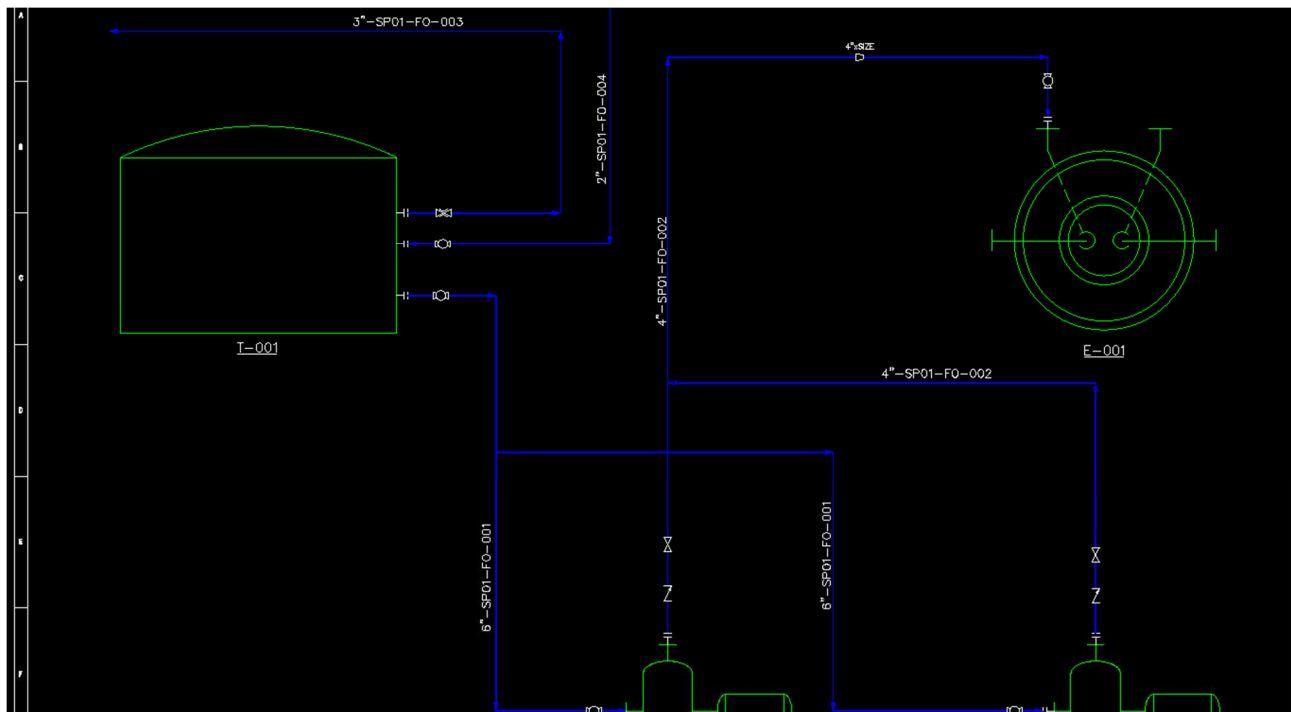
Have a look at the reducer. Main size is already updated based on the size of the process line.
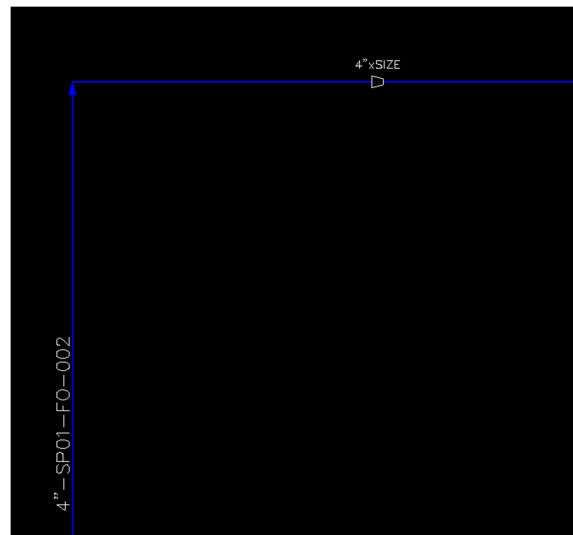
Assign the process line of other side of the reducer, then it will display both main size and run size. Reducer flips automatically based on the line size.
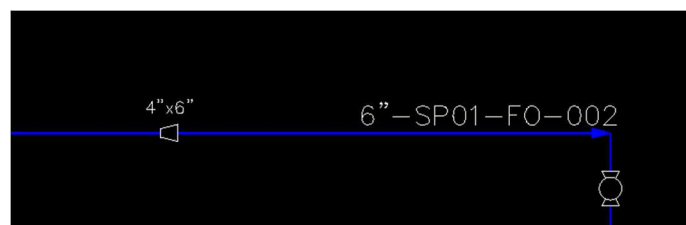
Assign Inline Components/Valve

To assign components, select the assign tag function and click on the symbol of the component. The assign Tag dialogue box will appear.
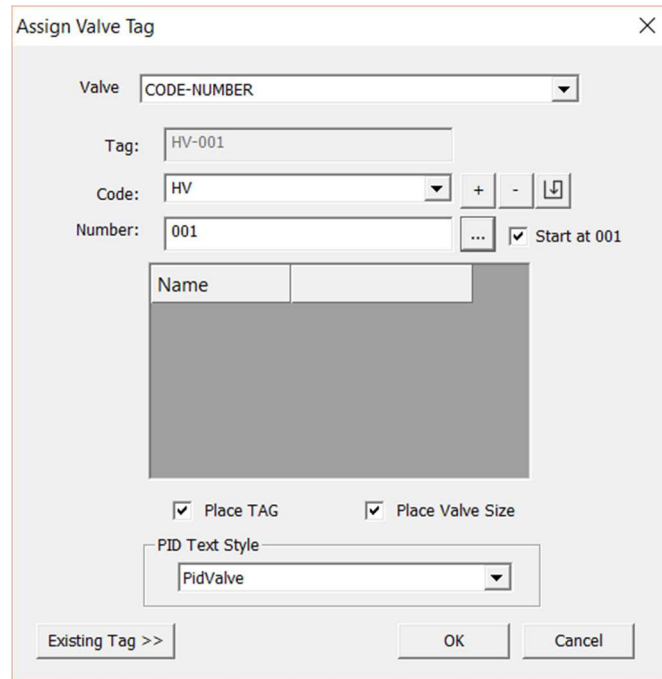
(i). Annotation Style: The style of the annotation user want to display the tags for components. If you drop down you can see the custom annotation styles which user created earlier using **tag format settings**.

(ii). Tag Preview: previews the tag format which is going to be placed in the drawing.

(iii). Type/code: displays the different type of valve codes. Drop down to select different valve code.

(iv). Tag number: numbers are automatic and start from 001, based on the placement order. Running numbers will be created depending on the type of code. If user wants to start at 001 for each code, check the **"start at 001"** checkbox. Automatic number contains # in front of the number. To set that as tag number, click on ⌐ button.

(v). Custom fields: this is the place where all the custom tags will be displayed. Custom tags are created, using **Column format settings**.

(vi). Place Tag: check box to display or hide the tag for valve.

(vii). Place Valve size: check box to display/hide the size of the valve.

(viii). Text style: displays the current text style selected.

Now click on the […] button to display our valve tag as "HV-001" and click on "OK".

Tip: User can use […] button to make the required code as default.

Place the tag in the drawing below the valve, and size of the valve can be placed on top the valve symbol. The size of the valve will be reflected by the size of the line.
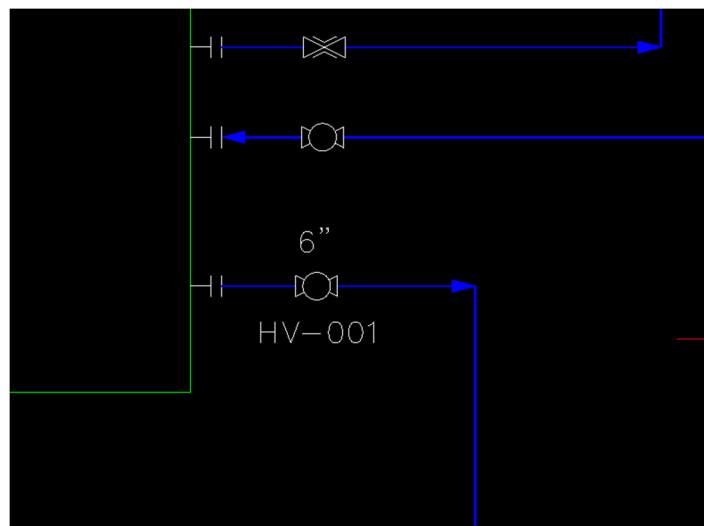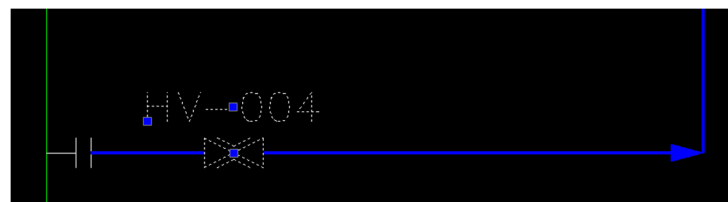
Assign all the valves same as below.
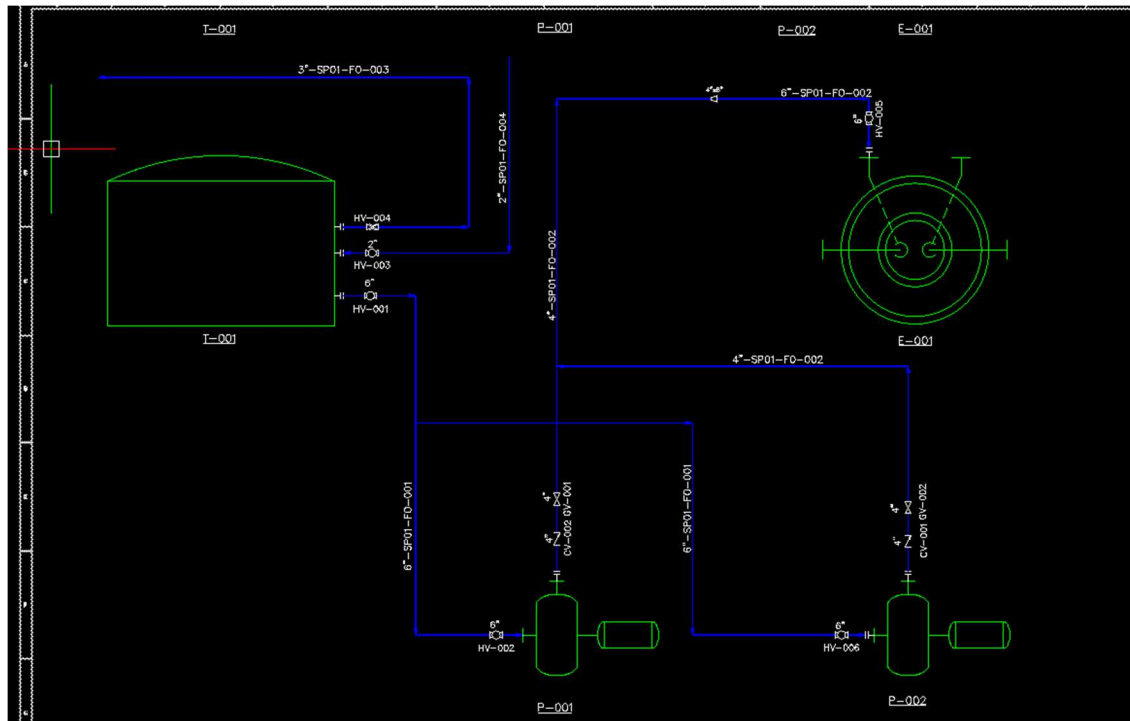
Move valve

To move the valve from one location to another, select the valve, pick the blue dot, drag and drop at the new location.

Edit TAG

To edit the already assigned TAG, select "Assign Tag" function from the P&ID ribbon and click on the symbol or component you want to edit. The 'Assign Tag' dialogue box will appear again.

Instruments & Instrument Lines 5

Instruments play a very important role in the process. Instruments exist of different types like control valves, safety relief valves, gauges and many more.

The SolidPlant P&ID library contains many types of instruments which helps user to design their P&ID faster and smarter.

Placing a Control Valve

Let's see how to add a control valve in the P&ID. Click on the **"Control Valve"** button on the P&ID ribbon
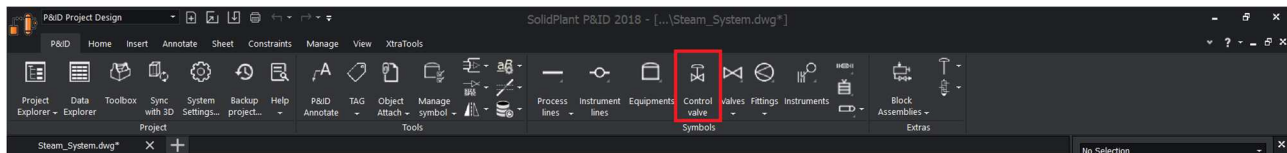
Control valve is a combination of two things

 i.   Valve body

 ii.   Actuator

After you click on the control valve button, a dialogue box will appear.
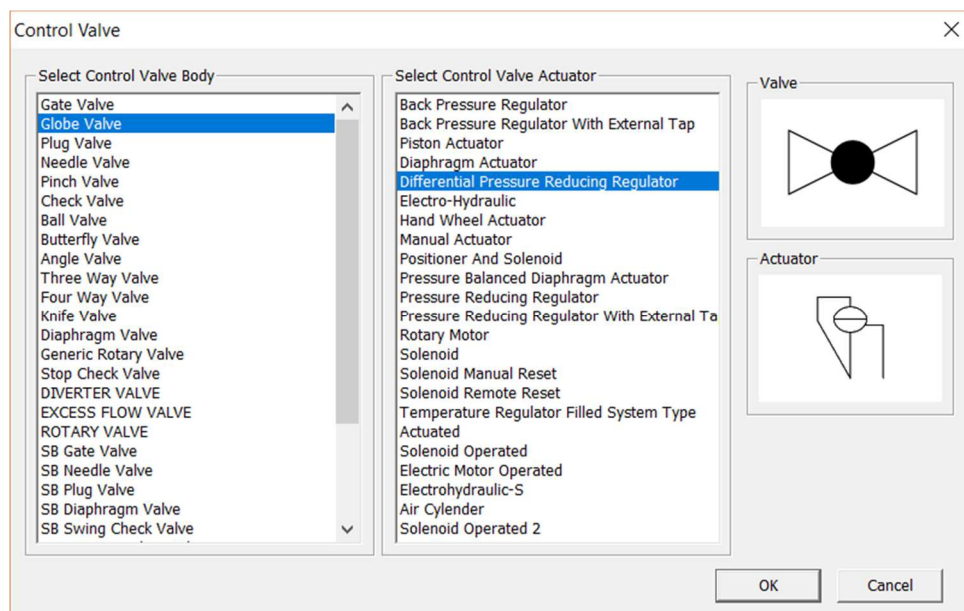
Select which type of valve you want to use based on the requirements, as well as an actuator. You can see the preview of the valve and actuator on the right side of the control valve dialogue box. After you select, click on "OK".
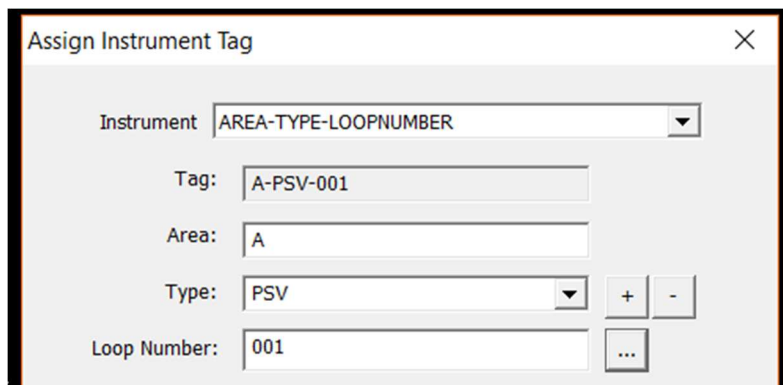
Place it on the process line. Assign tag dialogue box for instruments will instantly appear after we place the valve.
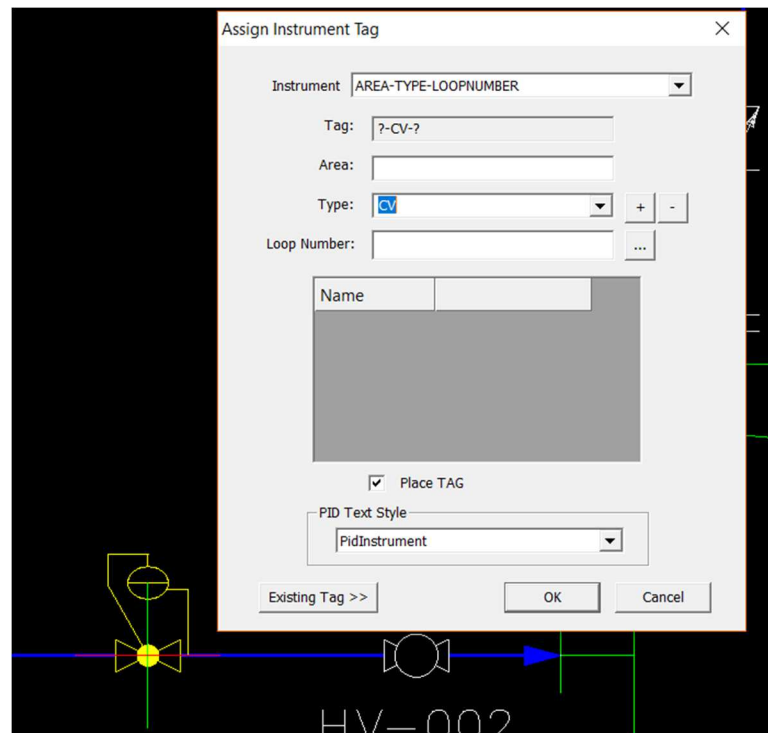
Tag format for instrument/control valve is "AREA-TYPE-LOOPNUMBER". Type in the area (area can be number or alphabet), select the type from the drop down, add any custom type you require and save it in to the database using "+" button. Number is automatic and starts from 001 after you click on [...] button or type the number manually.
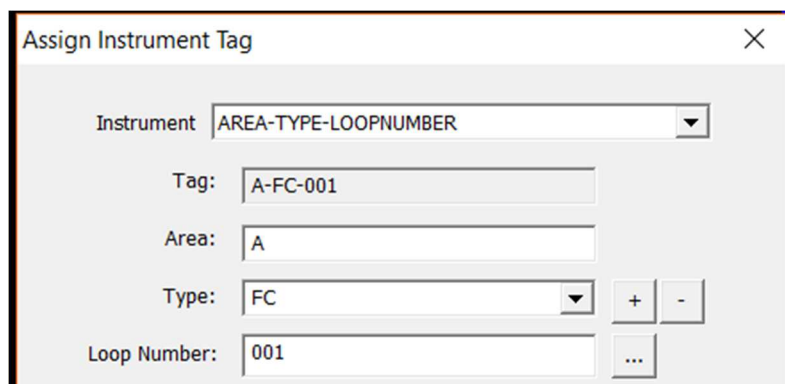
Click on "Ok" to place the tag in the drawing.

Tag placement for instrument is 2 times:

i.   Tag

ii.   Balloon

Place the tag at the bottom of the control valve and balloon at the top.
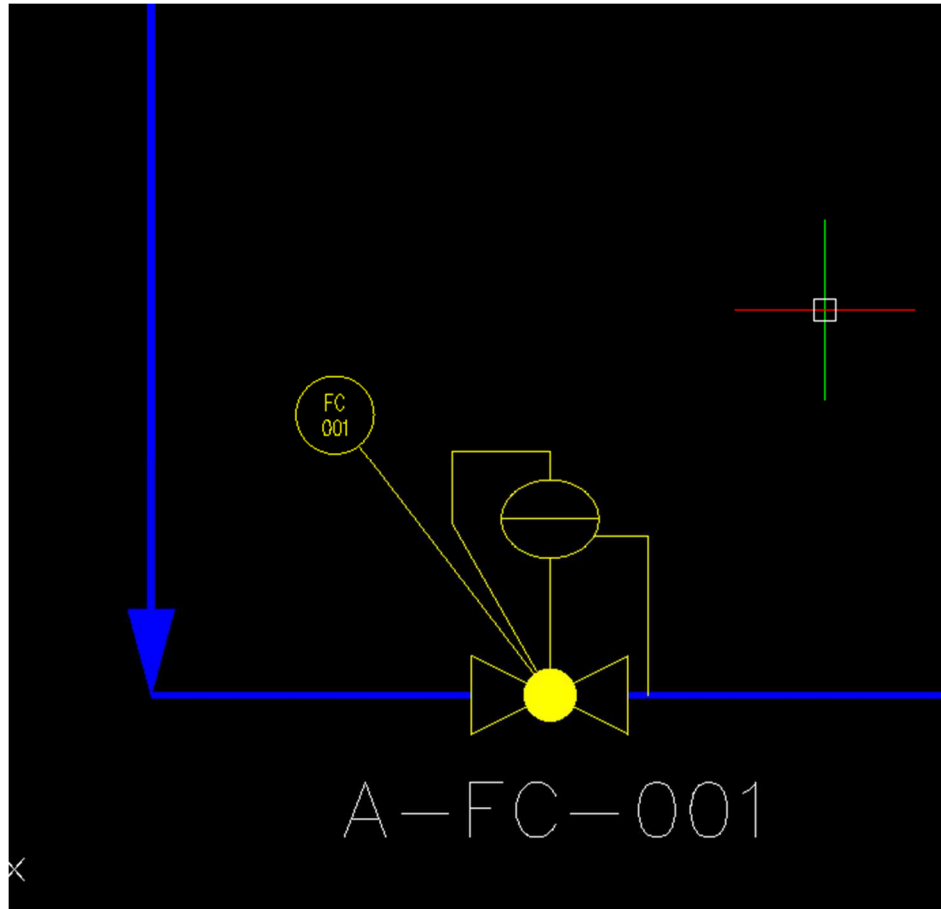
Placing a Relief Valve

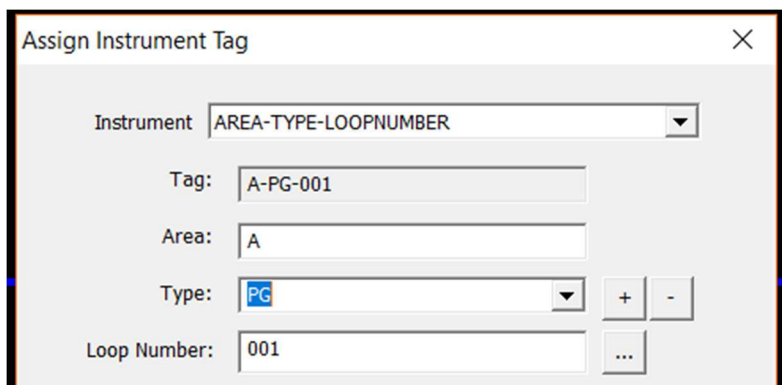Let's see how to add a safety relief valve in the P&ID. Click on the toolbox-> Instrument tab-> select relief valve left or right based on requirements.
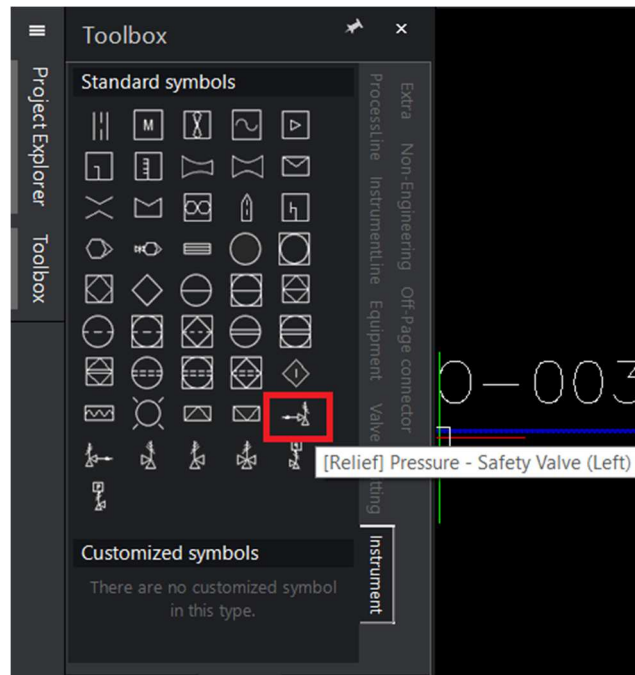
Place on the process line, and 'Assign Tag' dialogue box for instruments will instantly appear after we place the valve.
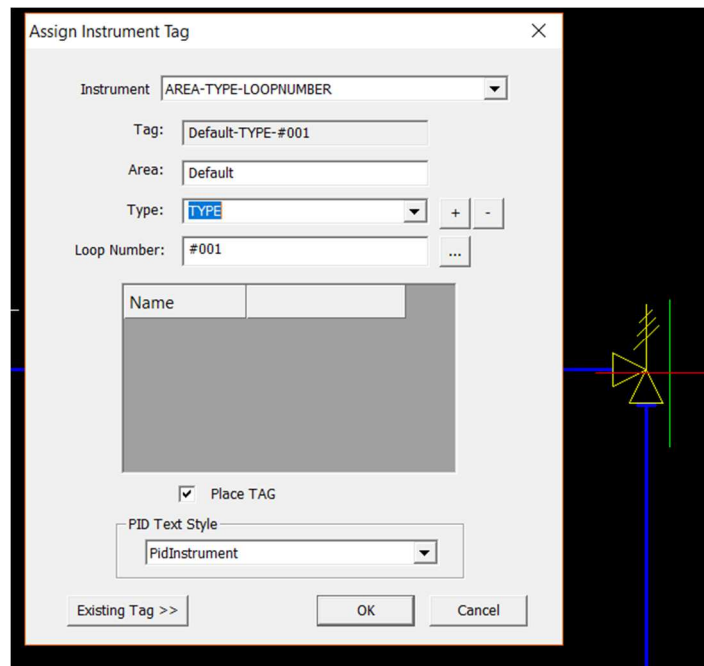
Tag format for instrument/relief valve is "AREA-TYPE-LOOPNUMBER". Type in the area (area can be number or alphabet), select the type from the drop down, add any custom type you require, and save it into the database using "+" button. Number is automatic and starts from 001 after you click on [...] button or type the number manually.

Click on "Ok" to place the tag in the drawing.

Tag placement for instrument is 2 times:

    iii.   Tag

    iv.   Balloon

Place the tag at the bottom of the control valve and balloon at the top.
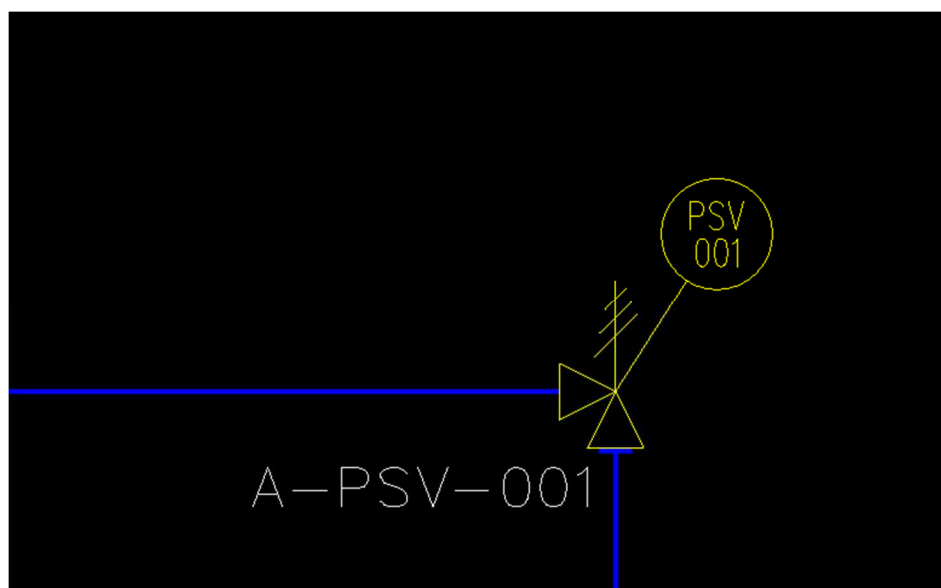
Placing a Pressure Gauge with valves

Let's see how to add a Pressure Gauge in the P&ID. Click on the toolbox-> Instrument tab-> select Field mounted discrete.
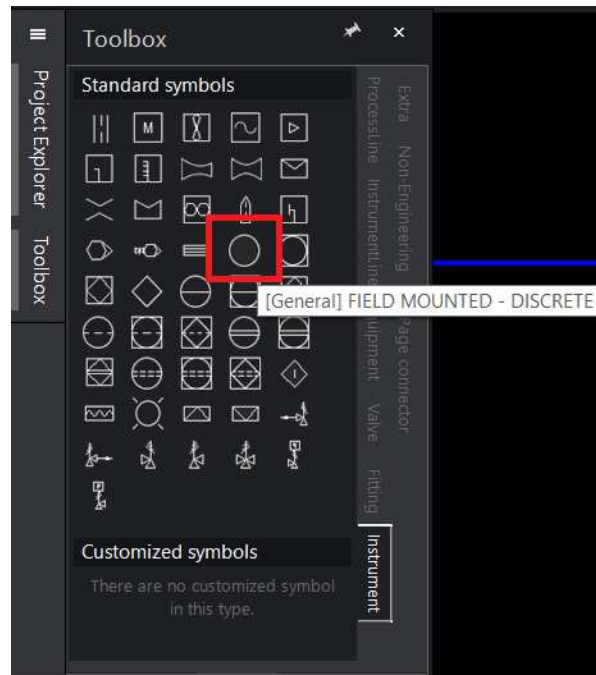
Select the location on the process line and draw towards the outside of the location until where you want to place your gauge. 'Assign Tag' dialogue box for instruments will instantly appear after we place the valve.
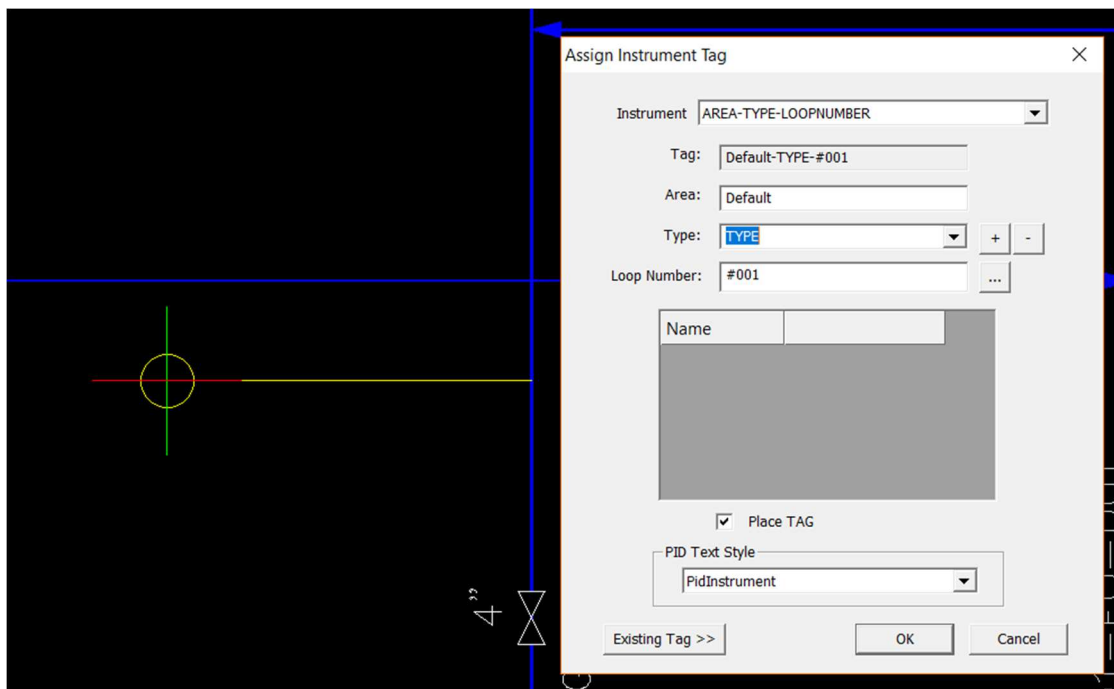
Tag format for instrument is "AREA-TYPE-LOOPNUMBER". Type in the area (area can be number or alphabet), select the type from the drop down, add any custom type you require, and save it to the database using "+" button.

Number is automatic and starts from 001 after you click on ⬚ button or type the number manually.

Click on "Ok" to place the tag in the drawing.

Tag placement for instrument is 2 times:

   i.   Tag

   ii.   Balloon

Place the tag at the bottom of the control valve and balloon at the top.

💡Tip: Hit Esc if you want to skip placing the tag in the drawing or uncheck place tag in the assign tag dialog box.

Now place the valves on the instrument supply line of the gauge. Click on toolbox->valve tab, select gate valve and place on the line same way we added the globe valve.
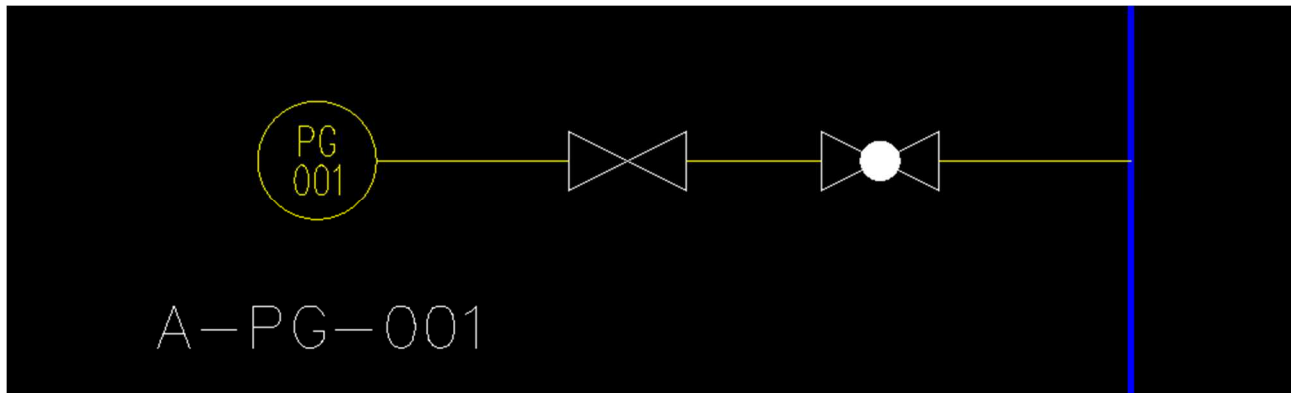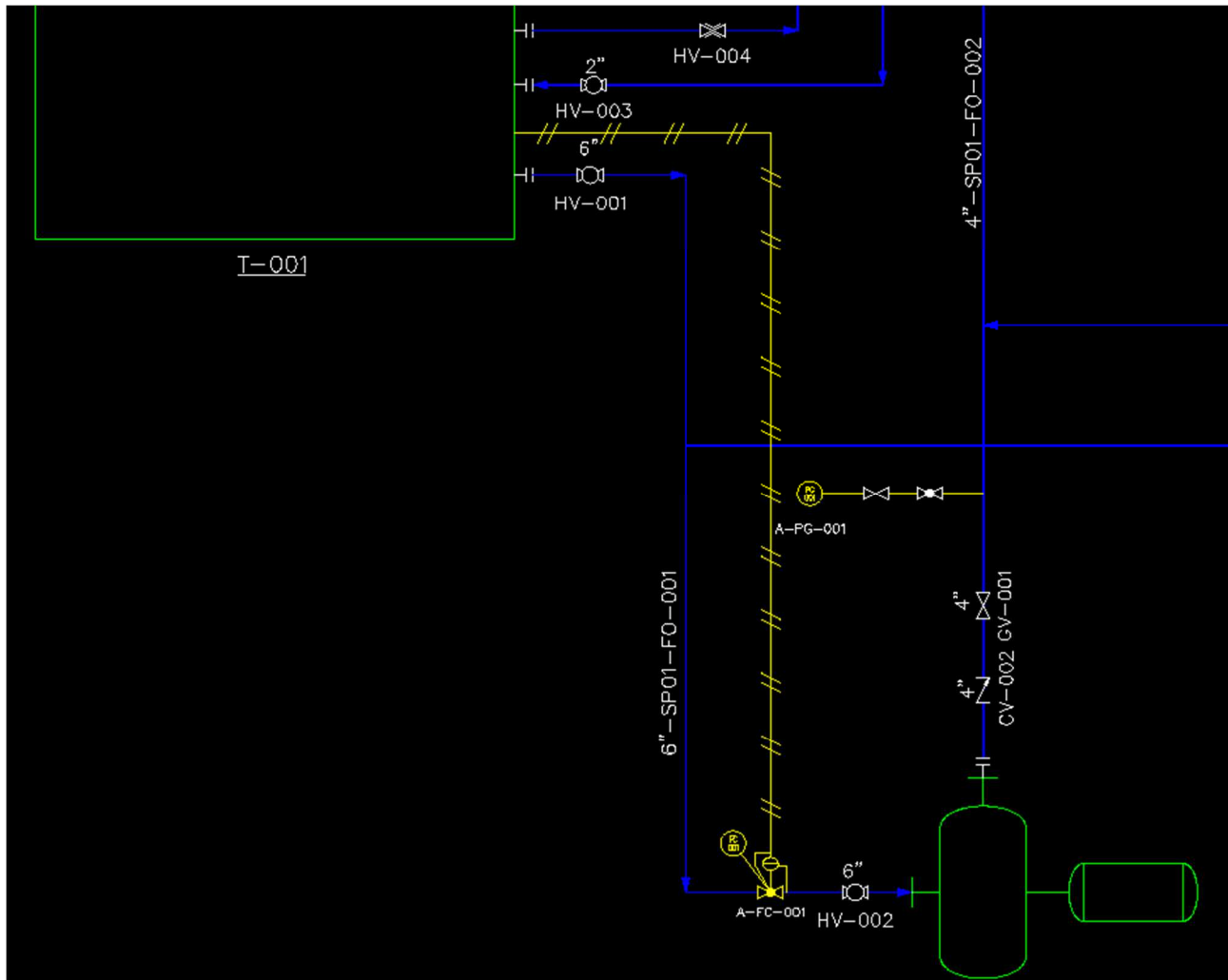

Add Instrument Lines

Let's see how to add an Instrument Line in the P&ID. Click on the toolbox-> Instrument lines tab, and select pneumatic line.
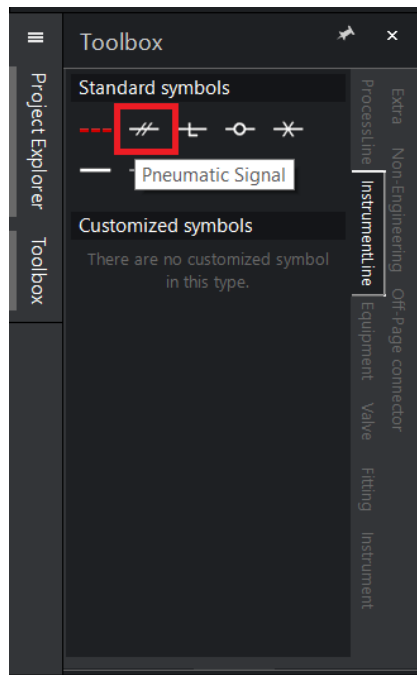
Select the location where you want to show this instrument line/signal line and draw it.
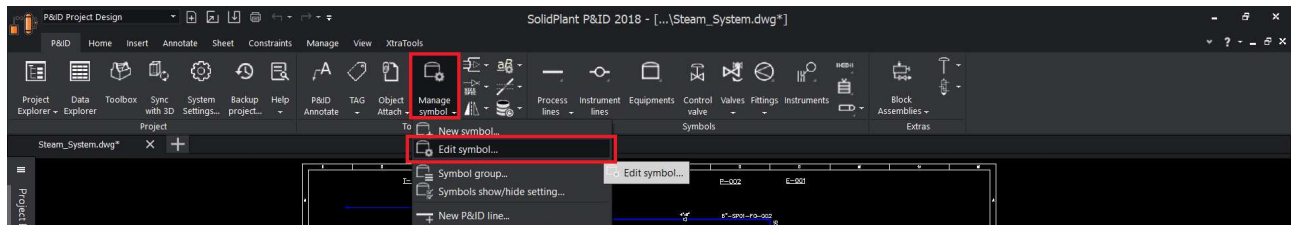
Example: connect from the control valve to the tank. Hit enter or space bar to finish the line.

SolidPlant P&ID

Edit Symbol

SolidPlant P&ID gives user the ultimate flexibility to edit the existing symbol in the library. User can modify the scaling of the symbols, and many more options.

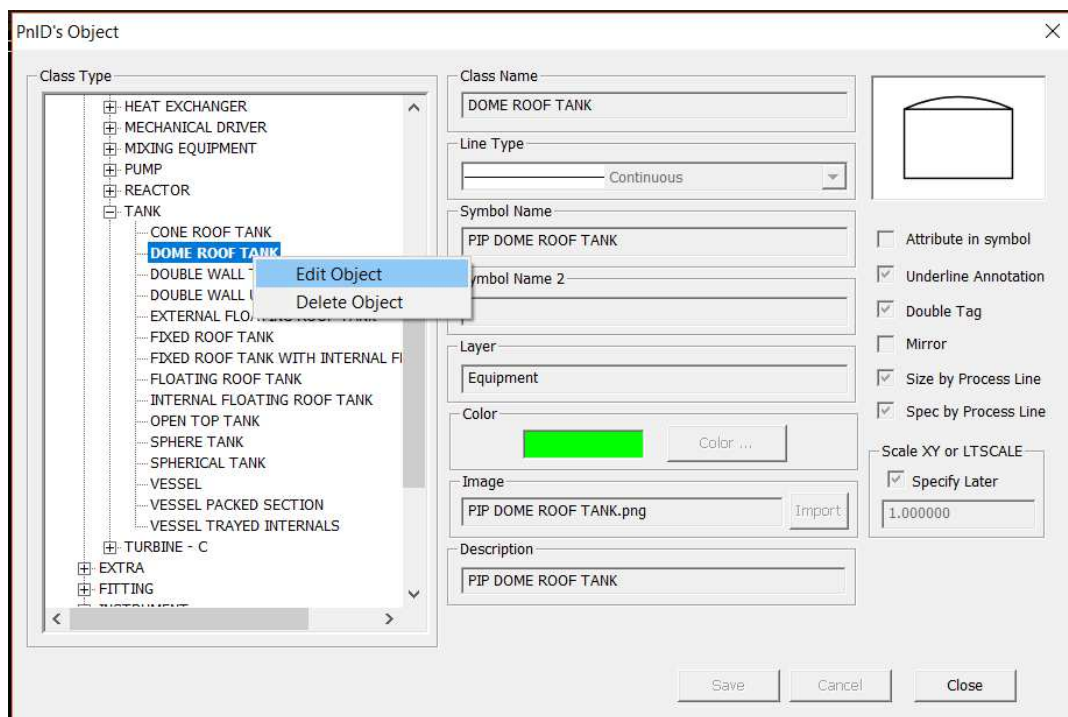To edit a symbol, click on "Manage symbol" drop down in the P&ID ribbon.

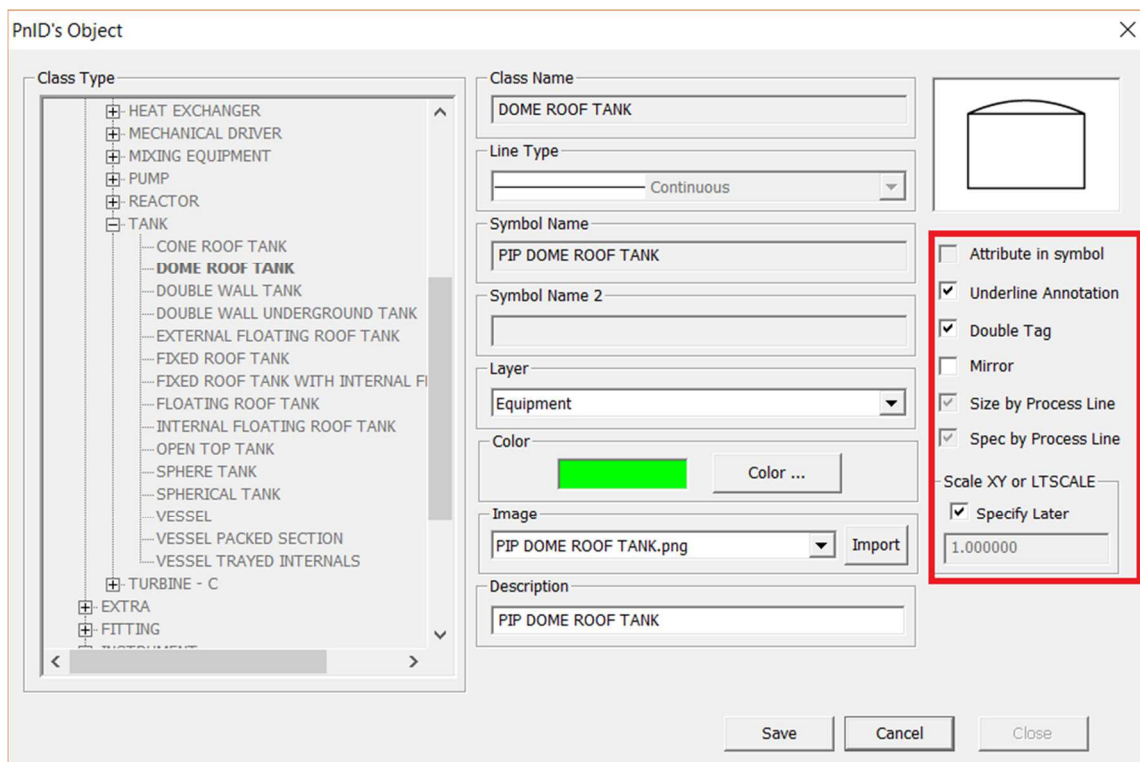After you click on the edit symbol, a dialogue box will appear.
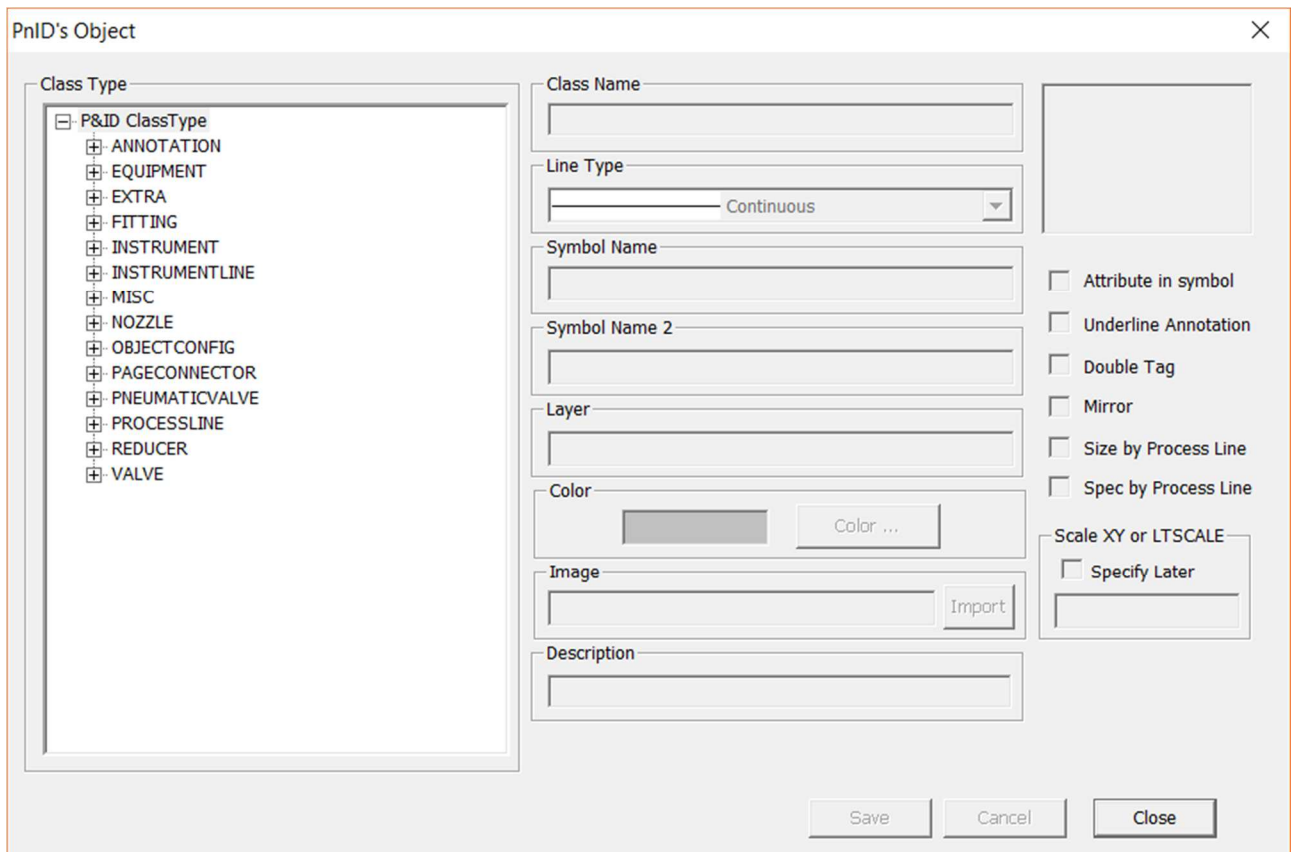
User can modify any of these objects.

To modify the equipment symbol, select which equipment you want to modify from the sub class, select that symbol and right-click on it and edit-object.

Here you can modify underline annotations, double tag and scale. Click "save" to save all the changes you made.

Advanced Features 6

SolidPlant P&ID helps designers to work smarter and faster with many advanced features.

Jacketed Pipe

Jacketed piping is commonly used to convey very viscous process fluids in an inner pipe, heated by steam/hot water/hot oil or other heating medium between the jacket and core pipe. With this feature, users will have more freedom to design piping systems for the most diverse kinds of projects.

Let's see how to create jacketed pipes in the P&ID. Click on the **"Jacketed pipe"** button on the P&ID ribbon.
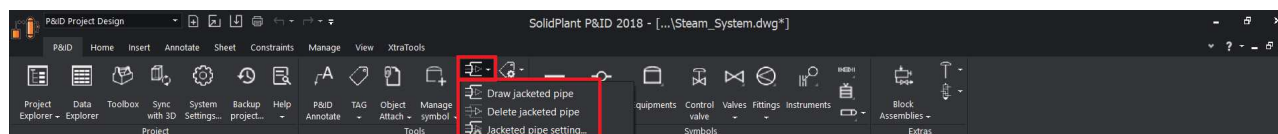
Jacketed pipe drop down has three functions:

i. Draw jacketed pipes

ii. Delete jacketed pipes

iii. Jacketed pipe setting

Jacketed pipe setting

Let's have a look at the jacketed pipe settings first. Click on the jacketed pipe drop down and select jacketed pipe setting function.
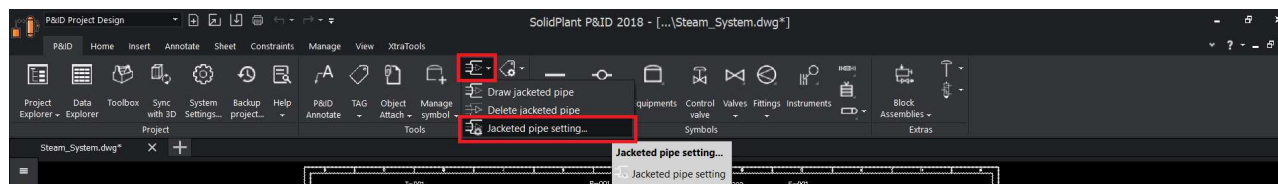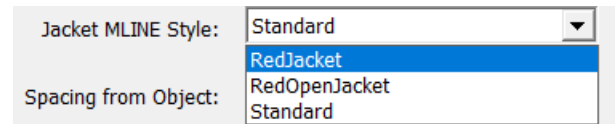

Jacket pipe setting dialogue box will appear.
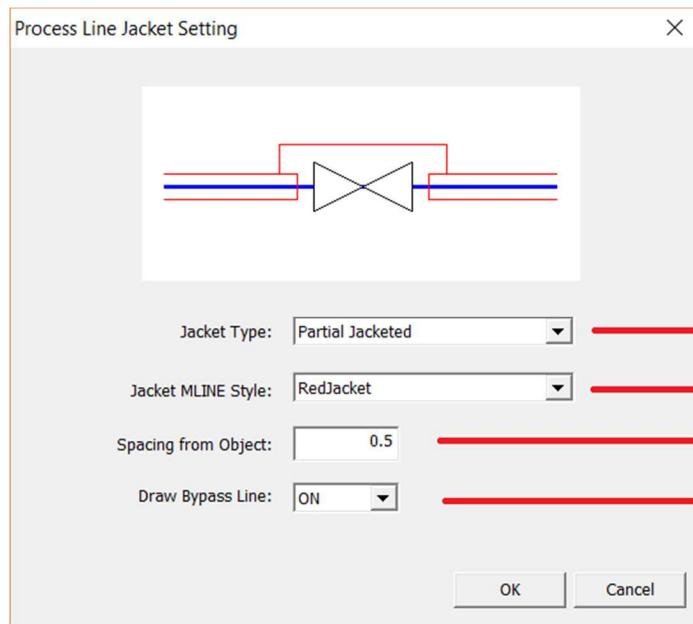
i.   Jacket type: Type of jacket you want to create around the pipe, either partial or full jacket(drop down to see different options)
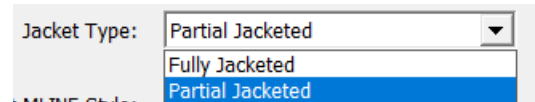

ii.   Jacket Style: style you want to display the jacket in. SolidPlant has 3 styles to display: Red jacket, Red open jacket and standard.


iii. Spacing: space between the valve/component with jacket.

iv.   Bypass: to display/hide bypass line for valve

Select which type of jacket you want to use based on the requirements. Also select jacket style. You can see the preview of jacketed type and bypass on the top of the dialogue box. After you select click on "OK".
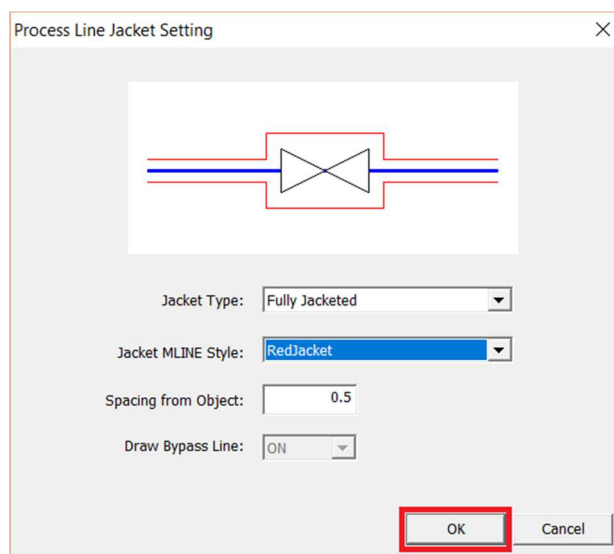
Draw Jacketed Pipe

Drawing a jacket over the process line is quite simple and automatic. Select **"draw jacketed pipe"** function from the jacketed pipe drop down from P&ID ribbon.
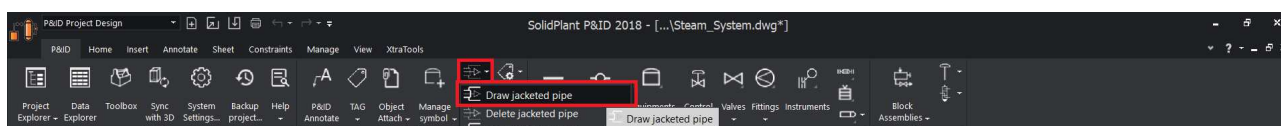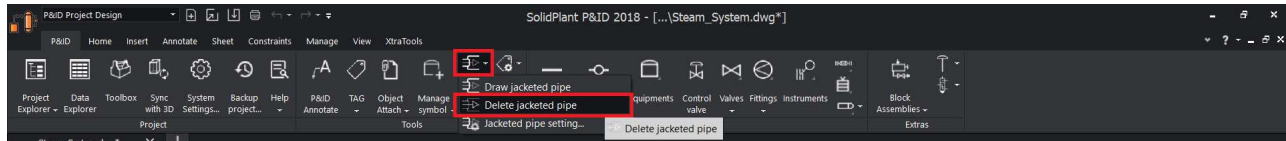

Now just click on the line where you want to add jacket over the process line. Jacket and bypass will be created if there are any valves or inline components in the line.
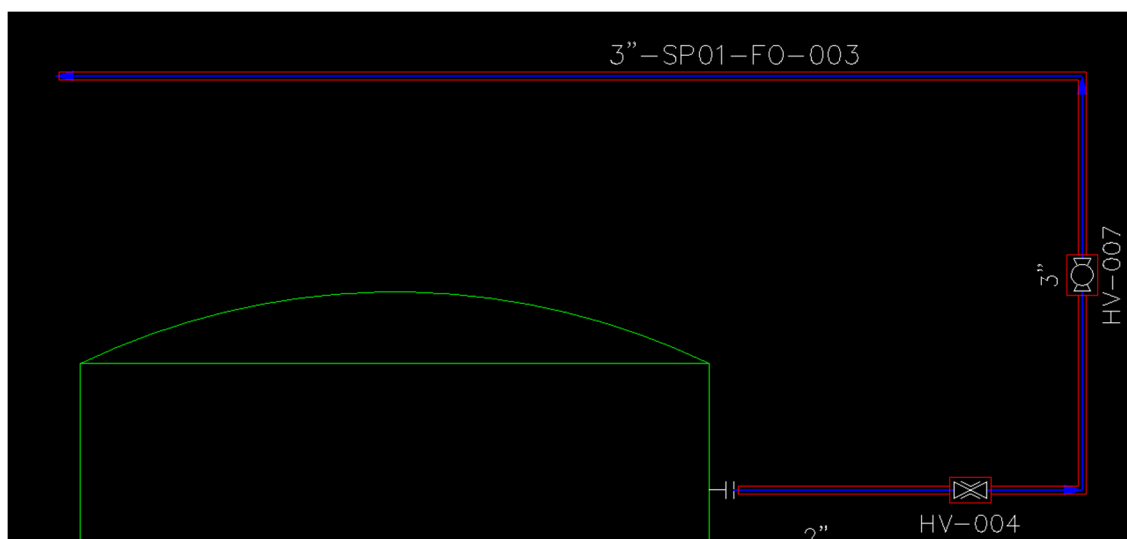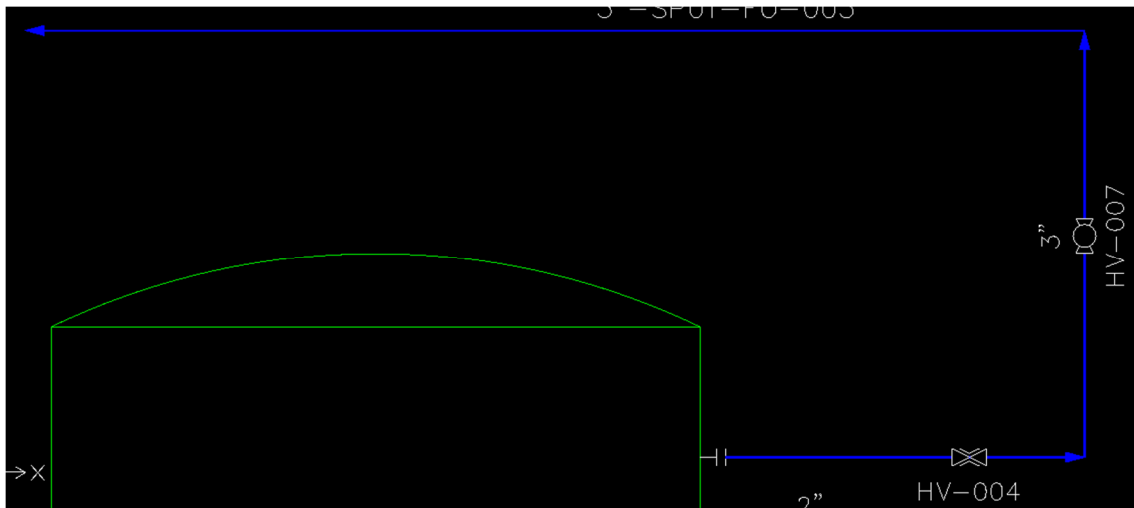
Delete Jacketed Pipe

To delete a jacketed pipe which is already drawn, select **"delete jacketed pipe"** function from the jacketed pipe drop down from P&ID ribbon.

Now just click on the process line (blue) where you want to delete the jacket over the process line. The jacketed line will be deleted.

Tip: to delete a jacket, click on the blue process line not on the red jacketed line.
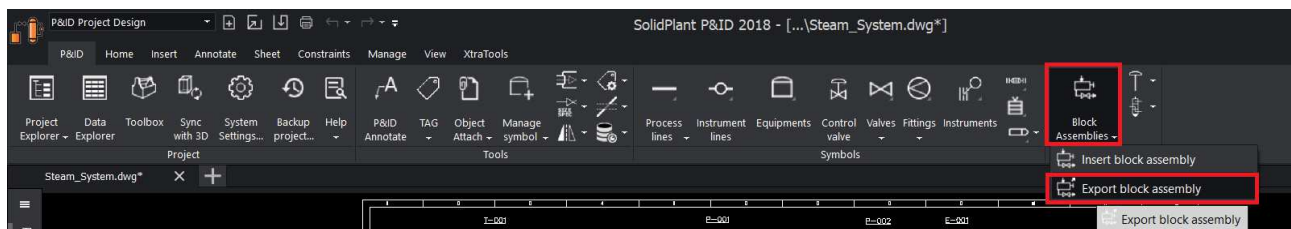
Block Assembly

In SolidPlant P&ID it's very easy to save your assemblies into the database and insert them in any of your drawings at any time. Whenever you're working on a project that has a lot of **typical assemblies**, this feature will save you many hours. With the function **'Block Assembly'** you can insert a saved assembly as many times as you want. After placing the assemblies, you can assign the tags. The system detects the existing tags and will suggest the next tag in sequential order. As all the data is copied, like the size of the components, only the tags need to be updated.

To access "Block Assembly", click on the Block Assemblies function on the P&ID ribbon.
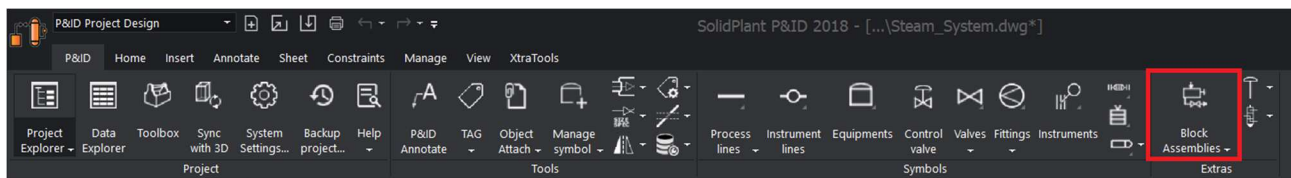
Export block assembly

To export/save an assembly, we use export block assembly function. To activate the function, click on the **block assemblies**-> **export block assembly**.
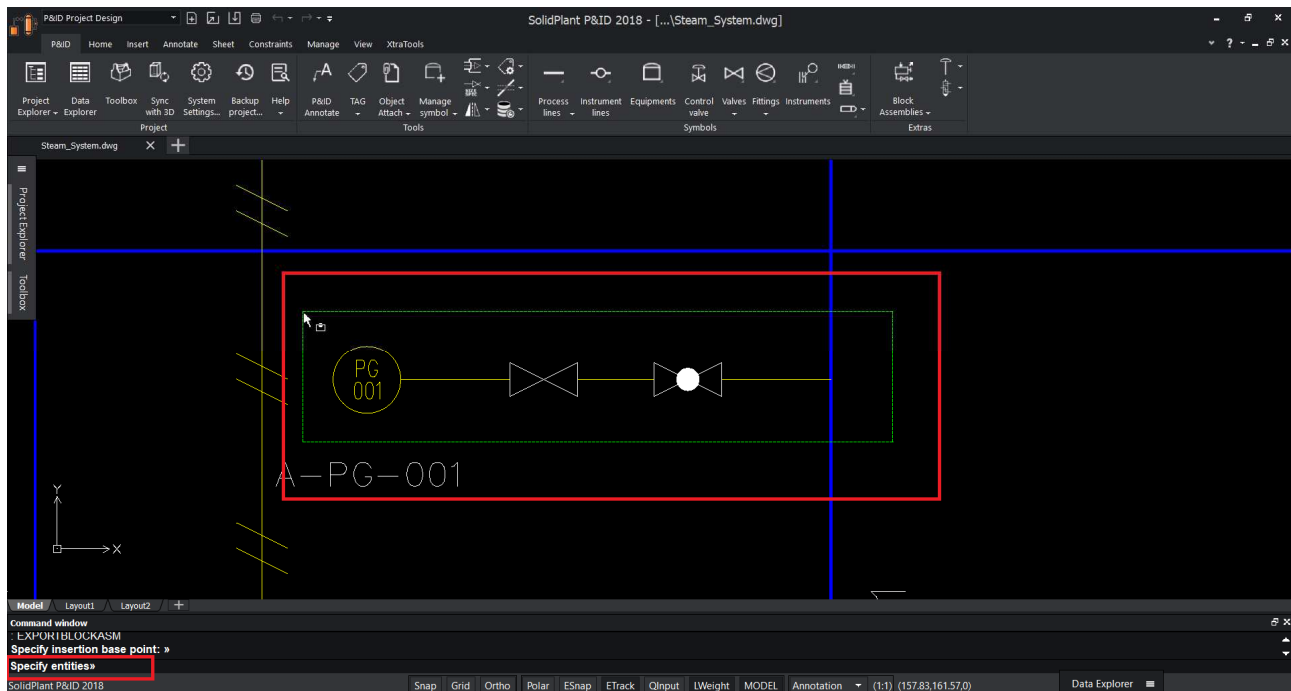

After you click on the export block assembly, a dialogue box will appear same as below. Enter the **assembly name** and click on "OK".
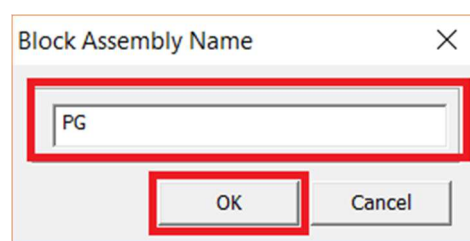
Now specify the base point for your assembly.
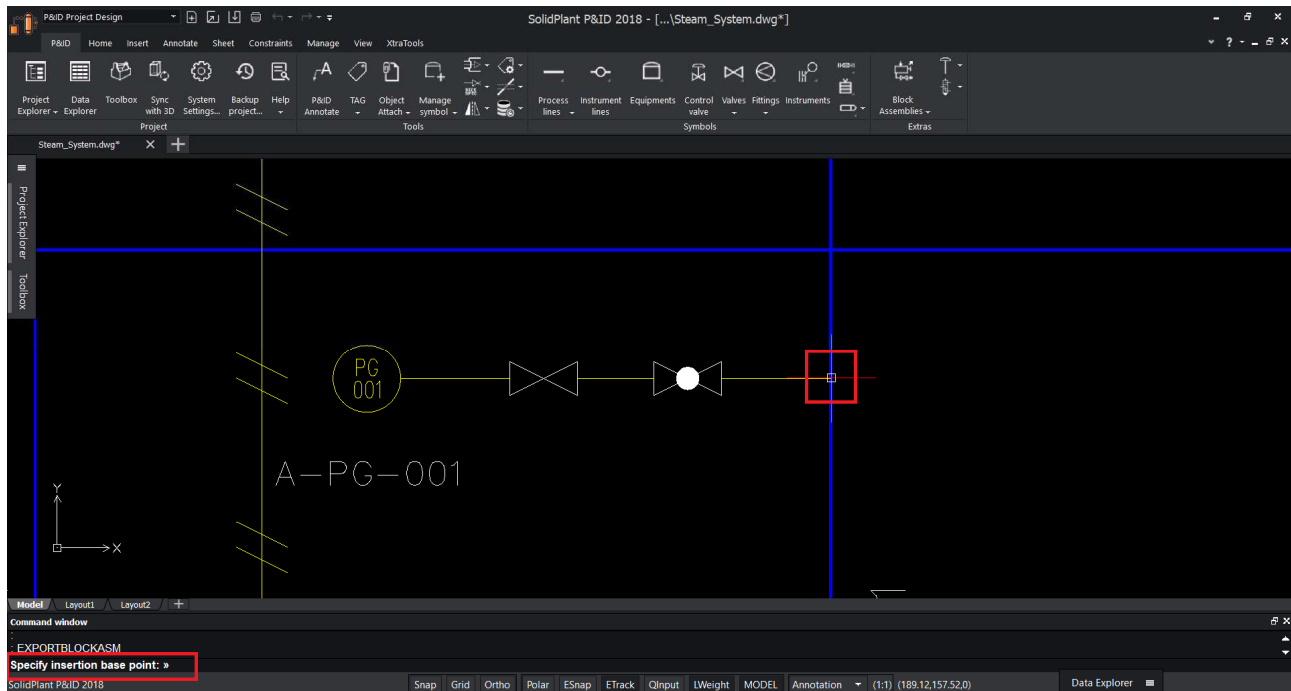
Now select the entities you want to save as an assembly, you can use box selection same as below image.

You can notice a command window, showing that the block assembly is saved in your project folder.
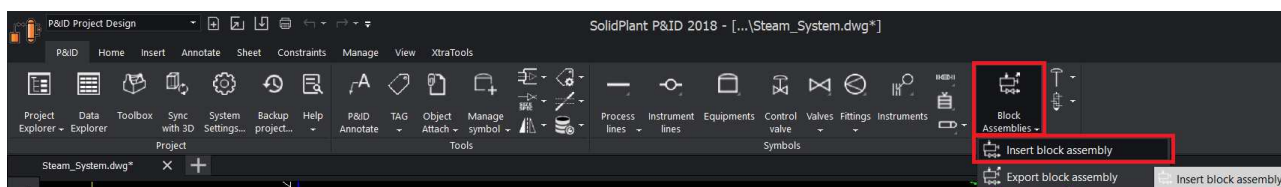

Command window
Save block assembly to 'C:\Users\Rajesh\Documents\SolidPlant 2018\Projects\Training Project\P&ID\PnID Drawings\PG.asm'
projexpreload
:

Insert Block Assembly

Now we already created/saved our assembly, we can insert that assembly anywhere in the drawing, based on the requirement.

To insert, click on Block assemblies -> insert block assembly

After you select the insert block assembly function, a dialogue box will appear where you can see list of assemblies you saved. If you select the name, you can also see the preview.
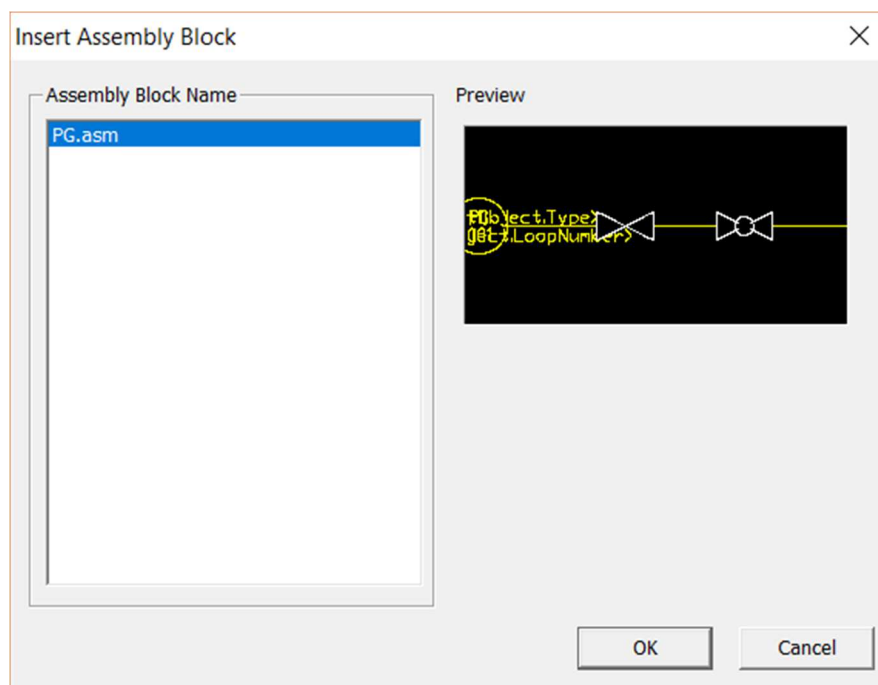
Select the name and click on "OK".

Now insert in the drawing and assign the tag for gauge and valves.
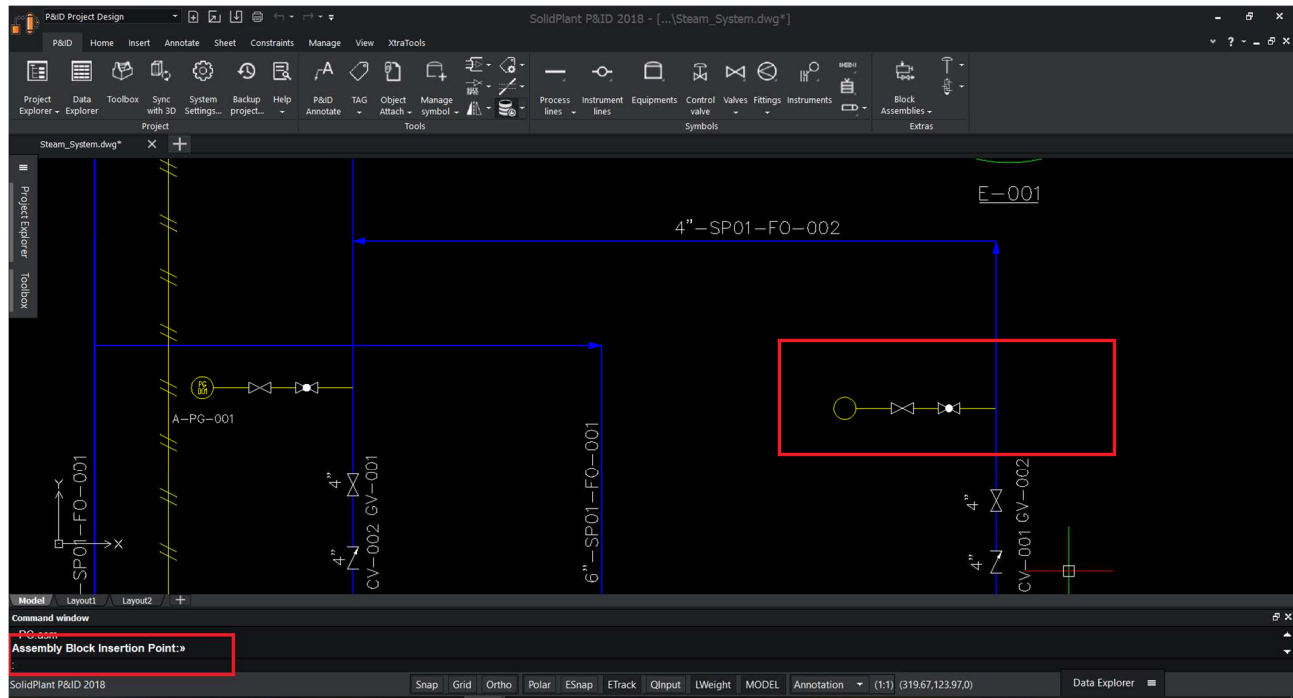
Delete Block assembly

To delete an already saved block assembly from the database, click on the project explorer in the document list under block assembly, and select the name and right click delete.
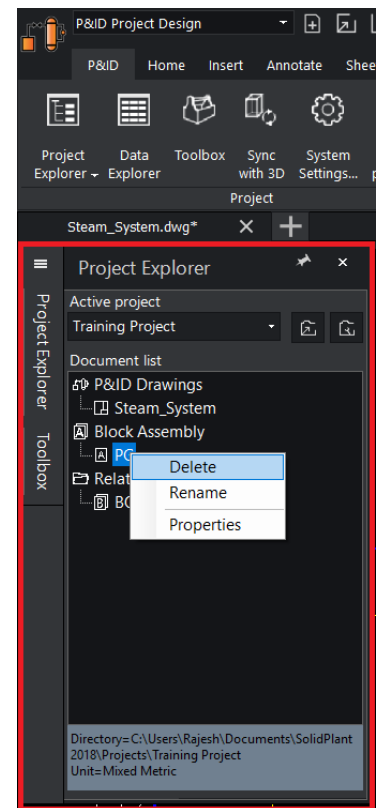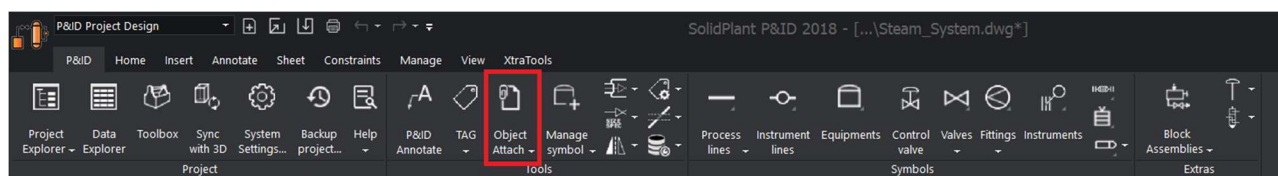
Object Attachment

In SolidPlant P&ID, it's possible to attach supporting documents to your drawing. With the 'Attach file to symbol' function, you can attach an object to any part of your drawing. Whether it's equipment, a valve, fittings, nozzles, anything is possible. You can attach a wide array of files to your drawing. For example an excel file of a status list, a jpg of a 3D model, a 2D drawing in pdf format, any document that you require.

To access object attachment, click on the **"Object attach"** function on the P&ID ribbon.

Attach file to symbol

To attach an external file to the symbol, we use "Attach file to symbol" function. To activate the function, click on the **Object attach**-> **Attach file to symbol.**
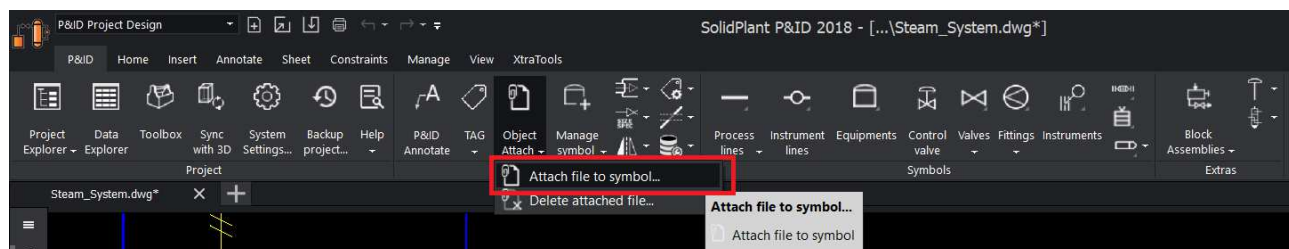
After you click on the 'attach file to symbol' function, select the symbol for which you want to attach some external references.

Example: Let's attach some 2D drawing files to the pump. Select the pump, you will see an attach file dialogue box.
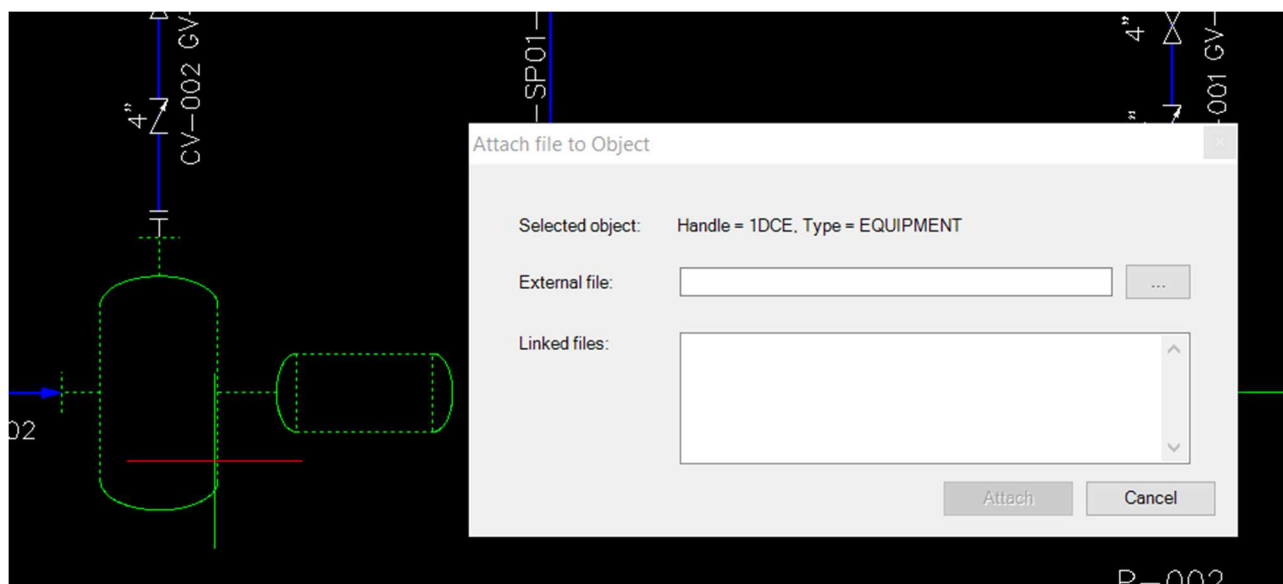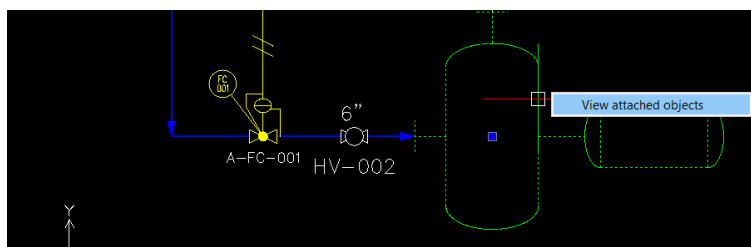
Now browse for the file using [...] button and choose the file to attach. The file can be any format, you can even attach a 3D model if you have that 3D viewer.

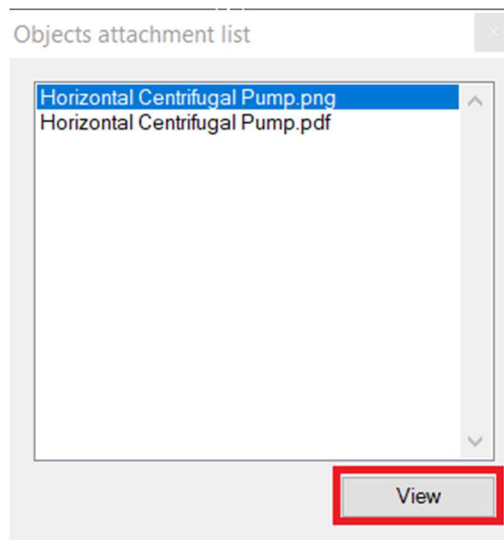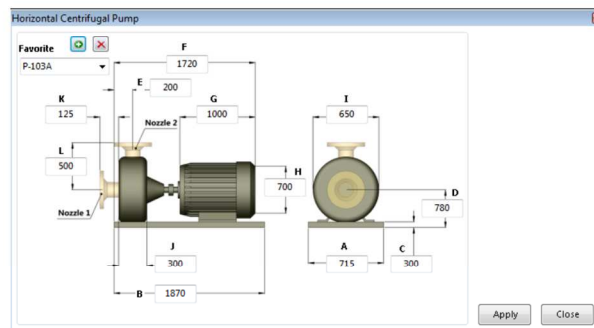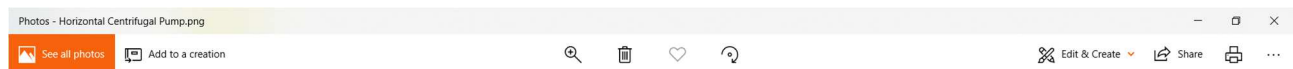After you choose the file, click on attach.
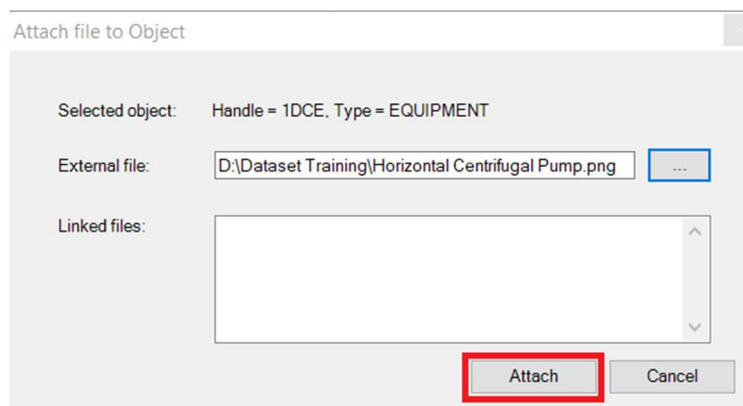
View attached files

To view the attached files, simply click the pump. You will notice a "view attached object" button.

After you click, you can see the attachment. Select and click on "view".


The attached file will open.

Off-Page Connector

SolidPlant PID offers an easy way to connect separate P&ID drawing sheets by using off-page connectors. Data will be transferred between the sheets without the risk of losing line information. Related sheets can be opened directly from the menu.

SolidPlant P&ID is capable of a multi-sheet environment, which helps user to design multiple drawings. User can place an off-page connector OUT to any line to indicate that it is going from one sheet into another. In the next sheet, user can place the connector IN and select the line from the other drawing. The line data is transferred from the first sheet, which allows you to continue drawing this process line, without worrying about data loss. As the data is already there, the TAG can be placed quickly.

Let's have a look how to do that, to access Off-page click on the **"Off-page"** function on the P&ID ribbon.
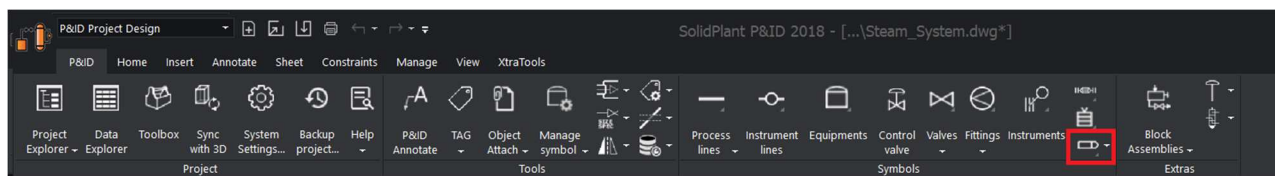
Off-page connector

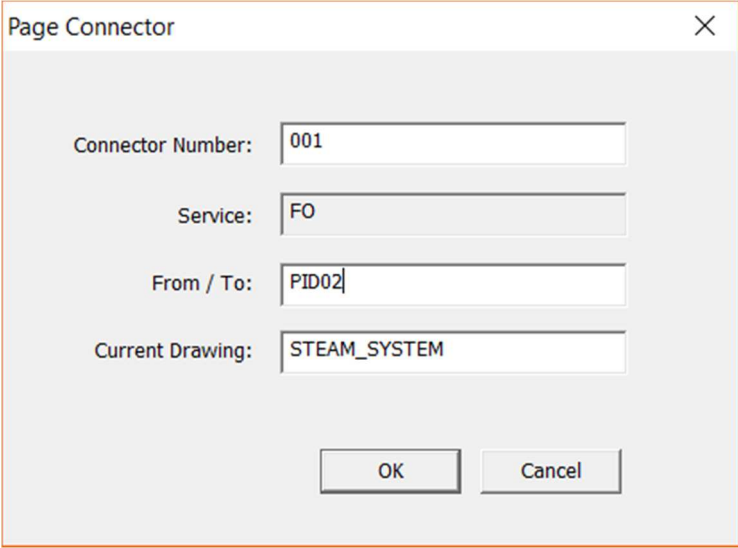To activate the function, click on the **Off-page**-> **Off-page connector.**
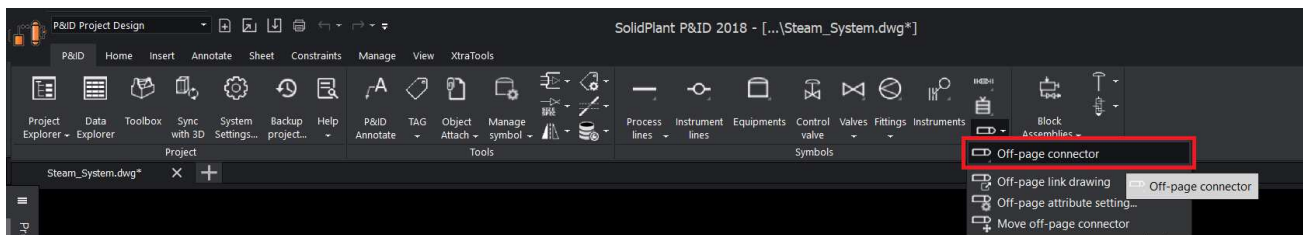
After you click on the off-page connector function, the toolbox will pop-up with off-page tab selected.
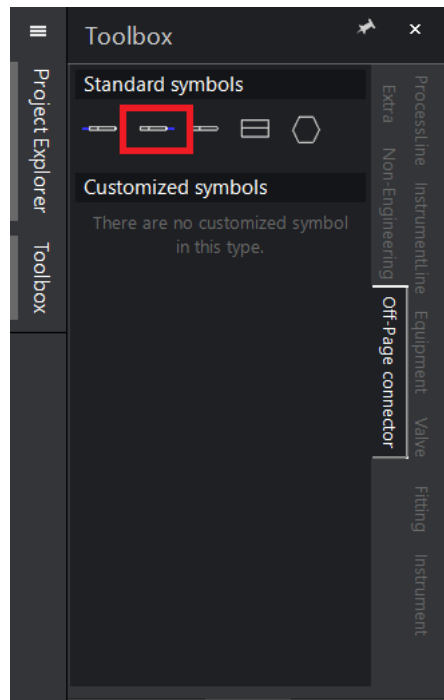
Now select the "connector out" button and click on the process line where you want to show the connector as going out.
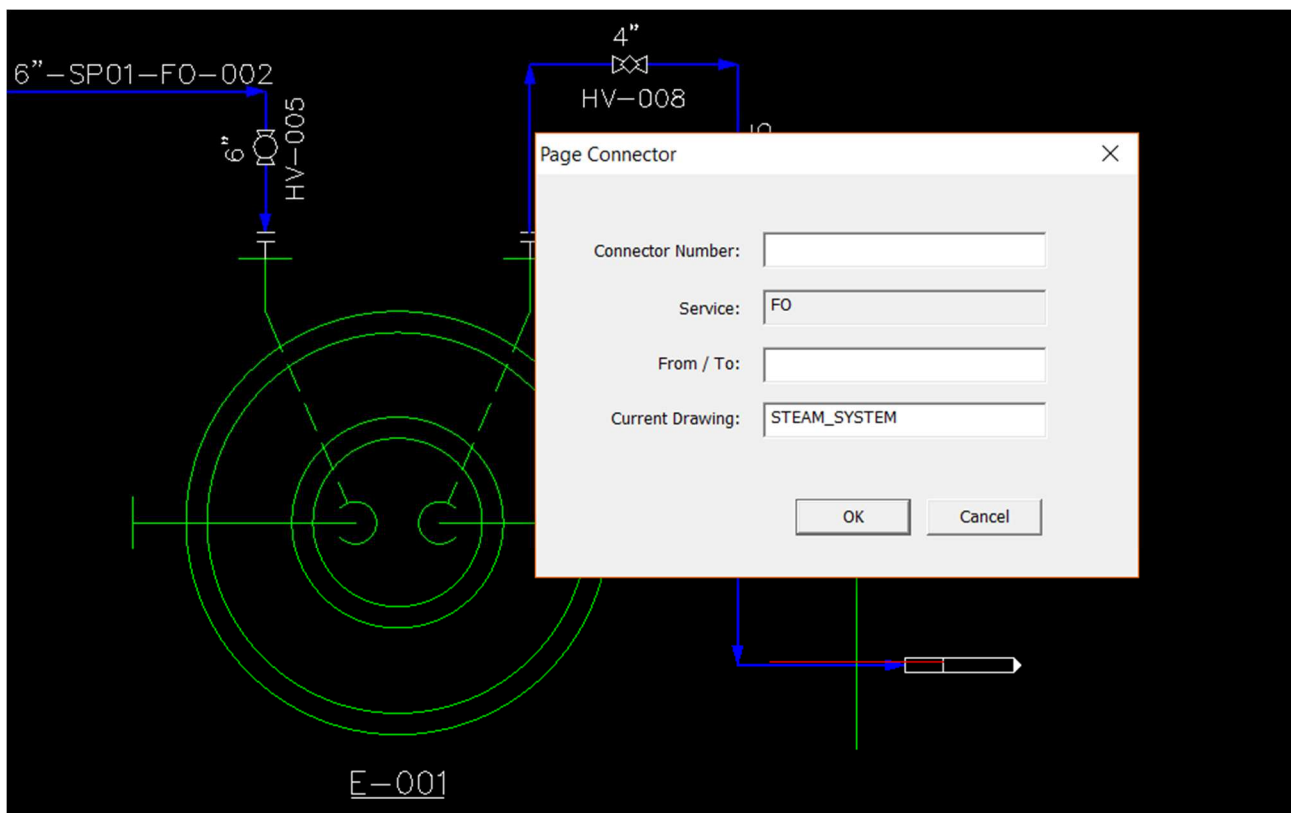
A page-connector dialogue box will appear. Give the connector number and 'to' (can be equipment/drawing number or name). 'Service' and 'current drawing' will be automatically taken from the process line info and drawing sheet.
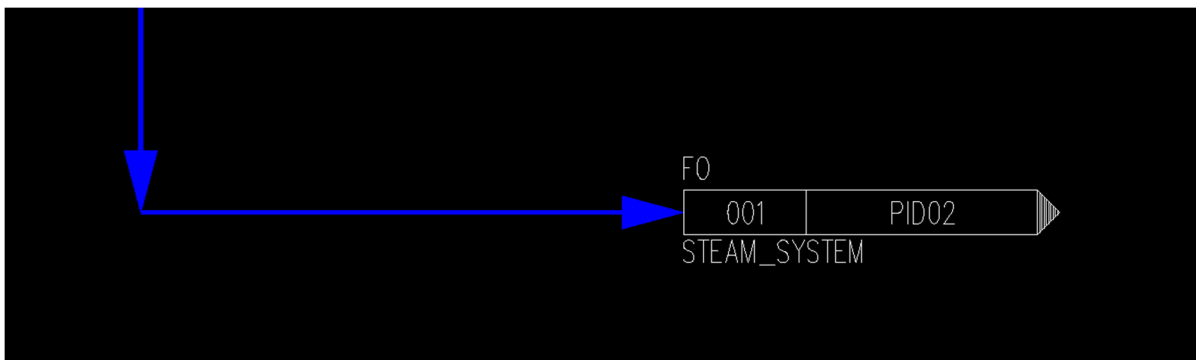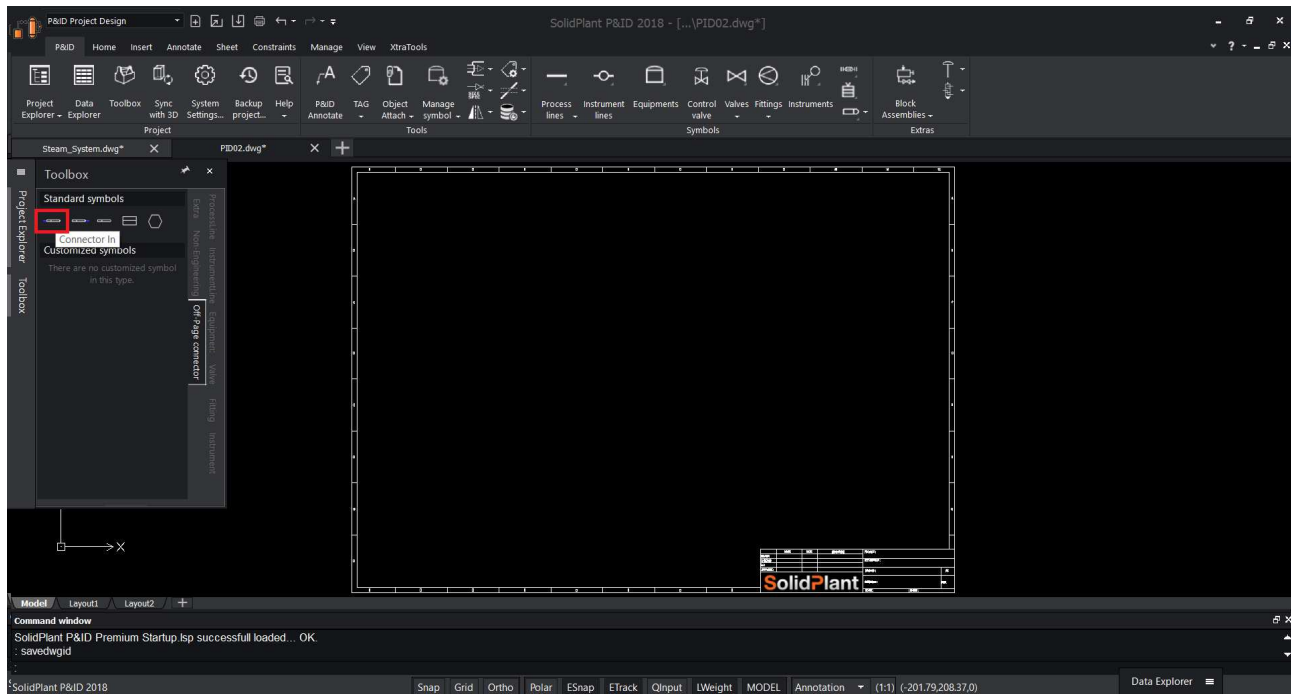

Click on "OK" to show in the drawing.

Now save the drawing and create a new drawing in project explorer under P&ID drawings.
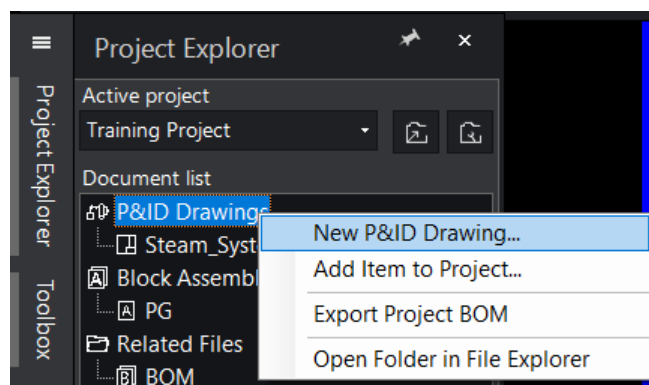
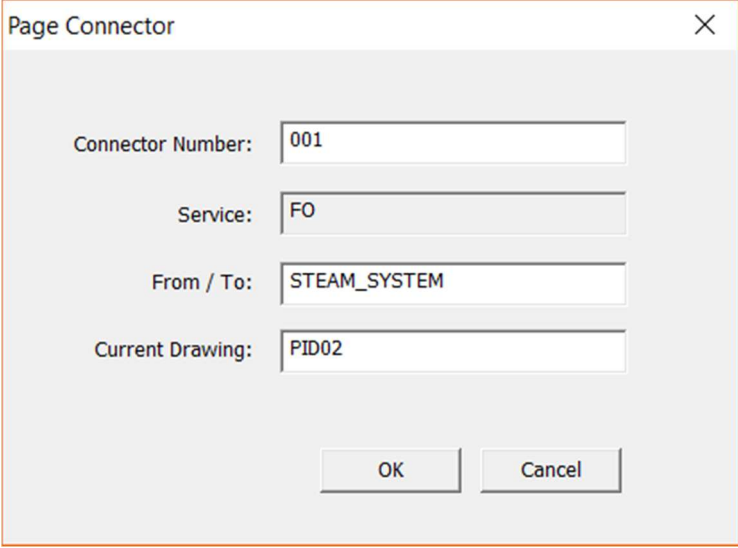Open the new drawing and click on the toolbox 'off-page connector' and select **"connector-in".**

After you click on the connector-in, a warning message will pop-up saying 'Please save the drawing that contains page-connector out'. Click on "OK".
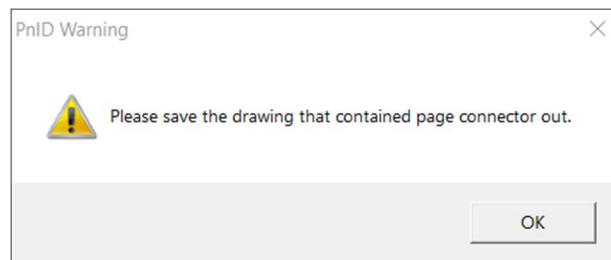
Another dialogue box will appear showing the list of connectors we have in our drawing sheets.
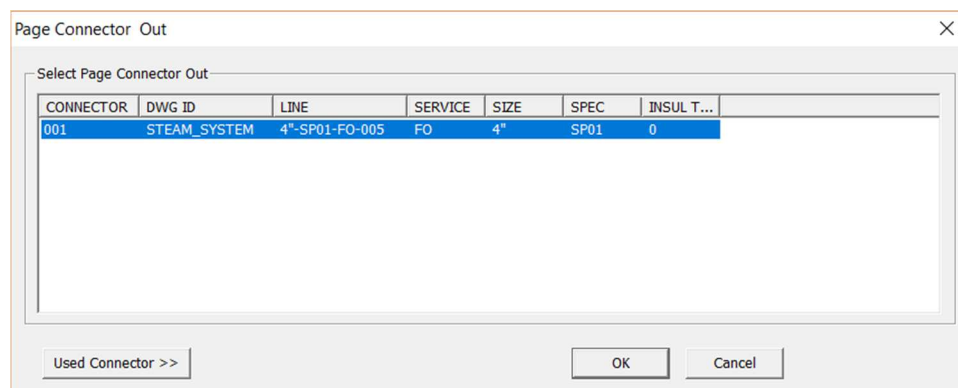
Select the connector and click on "OK". Place the connector anywhere in the drawing. User can rotate which angle in which he wants to place it. Page-connector dialogue box will appear with all the data transferred to connector-in.

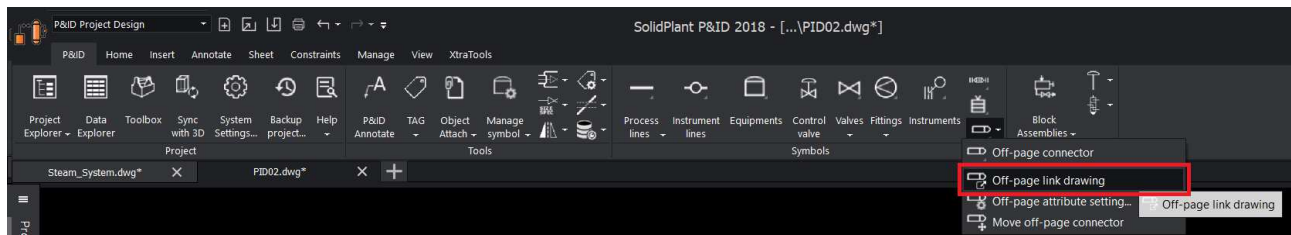Now connect a process line from connector-in and assign tag. User can observe that all the data is transferred.
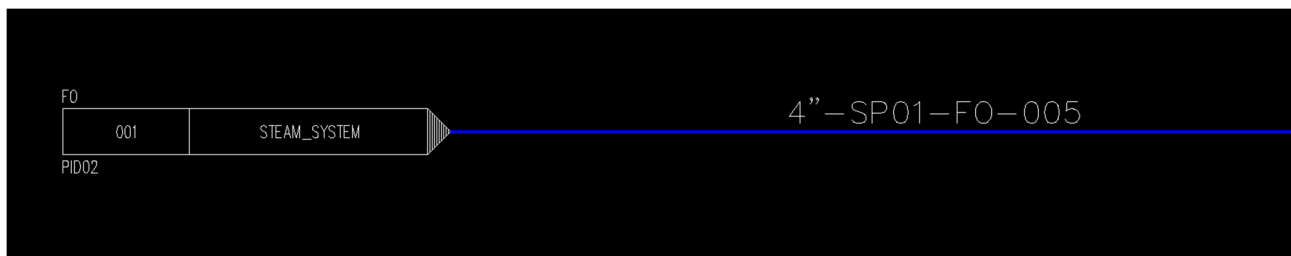
Off-Page Link drawing

SolidPlant P&ID gives user an automatic function to open the connected drawings in the multi-sheet environment. We call it **"Off-Page Link".**

To access off-page link drawing, click on the "Off-Page link drawing" function on the P&ID ribbon.

The off-page link drawing button will show you which connector leads to what other sheet. Select the function and click on the connector in the drawing. The connected sheet will open automatically.
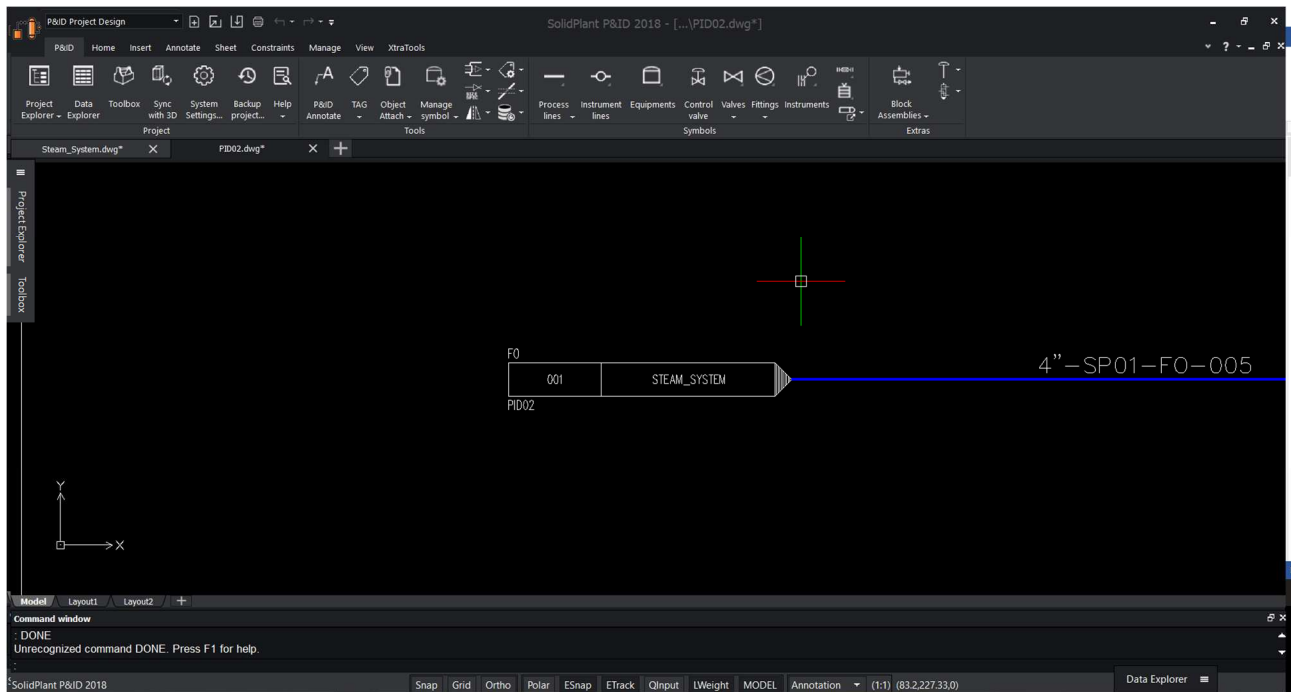
Break Line

In P&ID we have many lines which overlap on each other, to differentiate which line is going where, we represent the overlap with a break.

SolidPlant P&ID provides an automatic function to show breaks in the complete drawing with just single click.

In SolidPlant P&ID breaks can be represented in two ways, gaps or loops. Let's have a look at the break line setting.

Break line settings

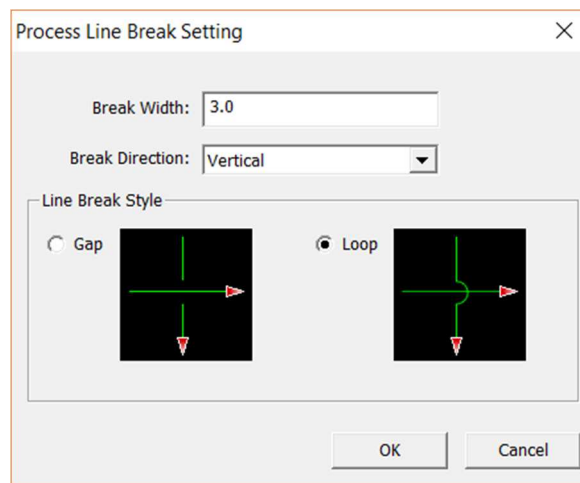To access break-line setting, click on the "Break drop down" function on the P&ID ribbon.
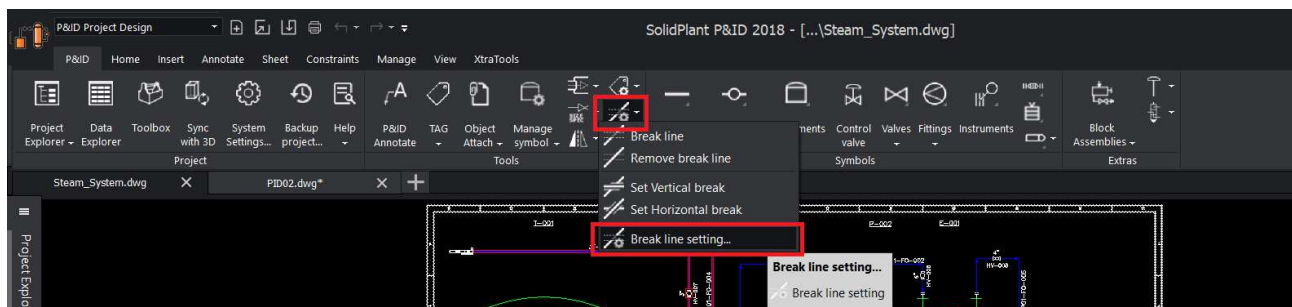
After we click on the function, a dialogue box will appear.
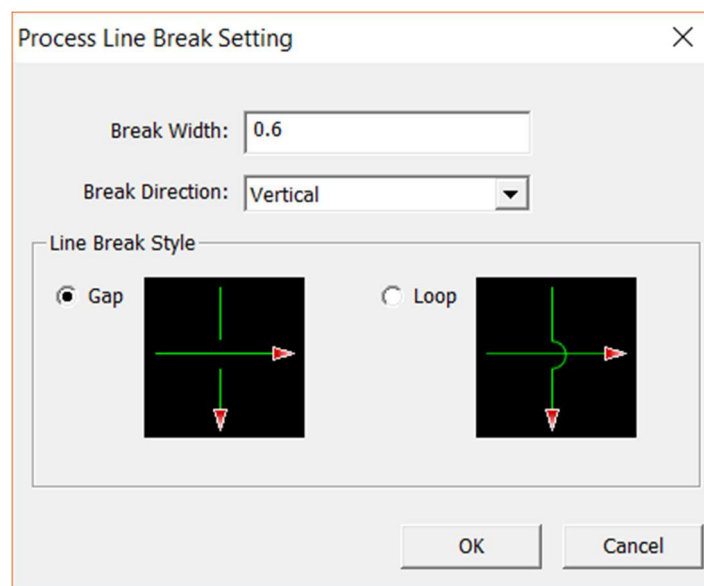
(i). Break Width: gap between the overlap lines.

(ii). Break direction: user can select which line he wants to show as 'break' either vertically or horizontally.
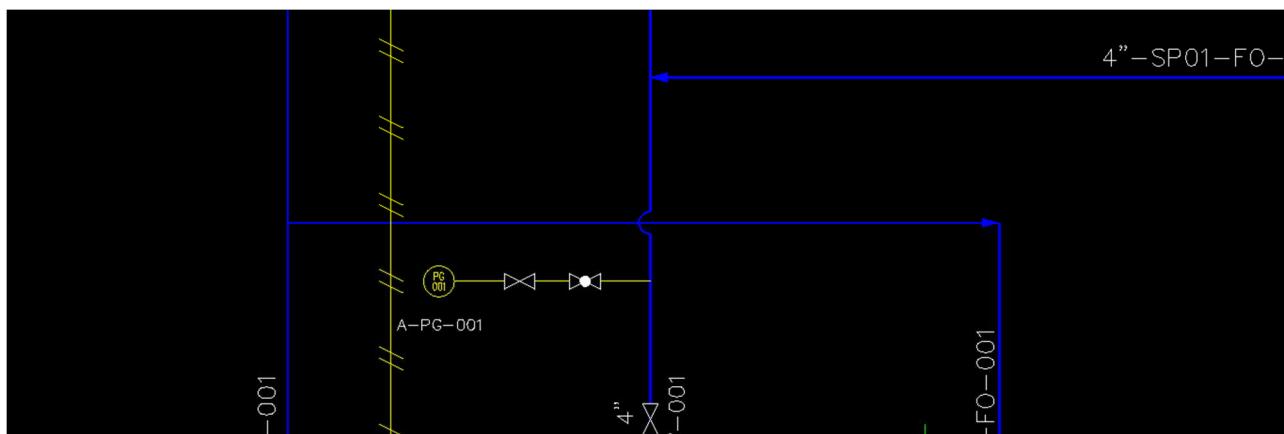
(iii). Break style: gap or loop

After we modify the settings, click on "OK".

Break Line

To show a break in the drawing, just click on the function **"Break Line"**. All the overlaps will automatically display the break symbol depending on what style you selected in the settings.
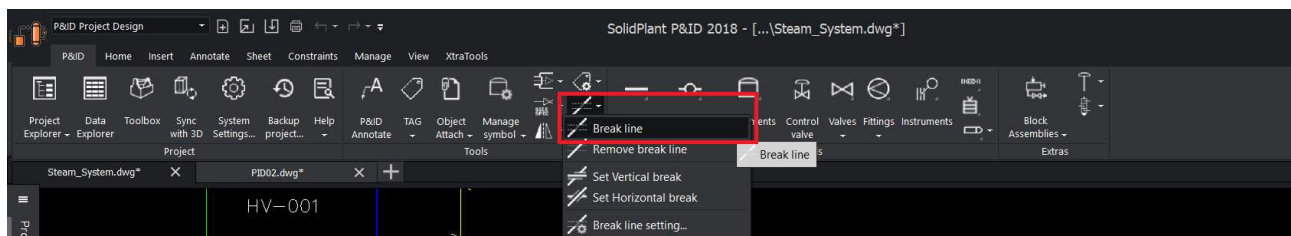
Remove Break Line

To remove a break in the drawing, just click on the function **"Remove Break Line"**. All the overlaps will be automatically removed.
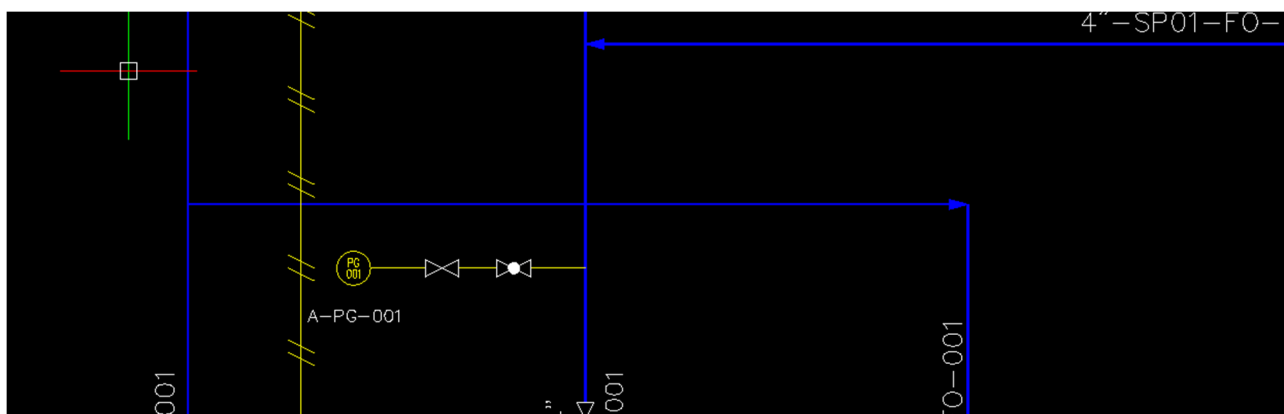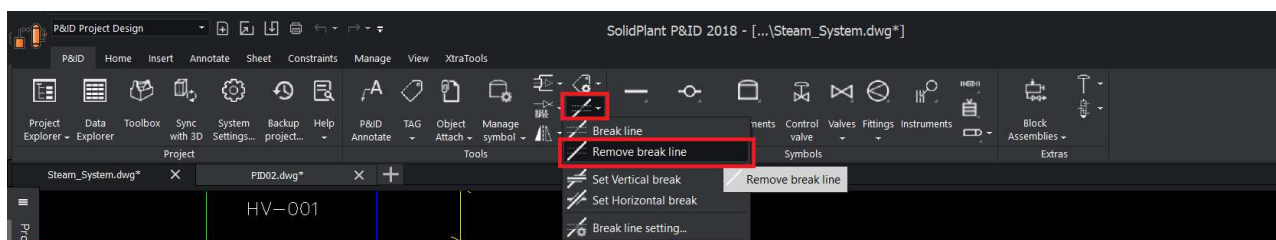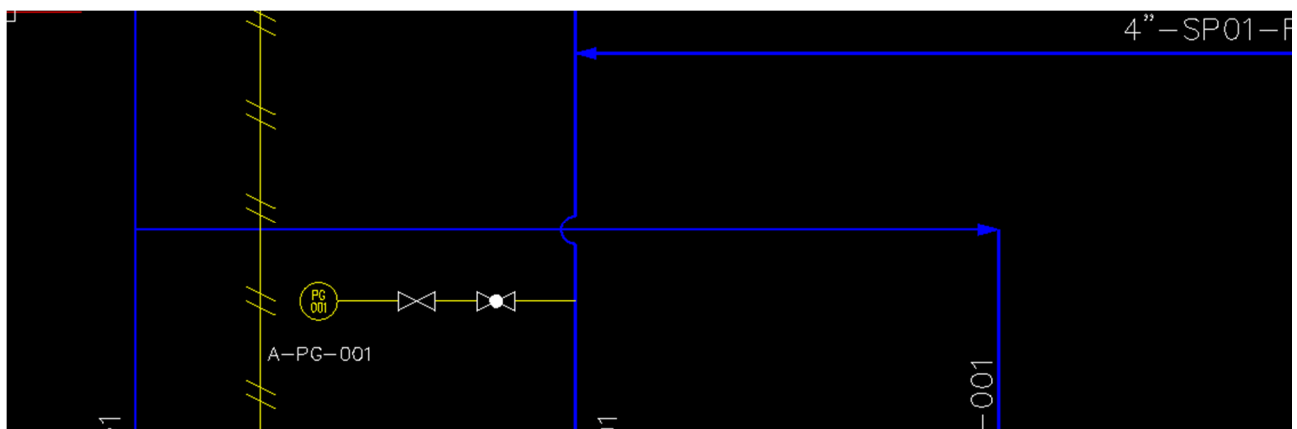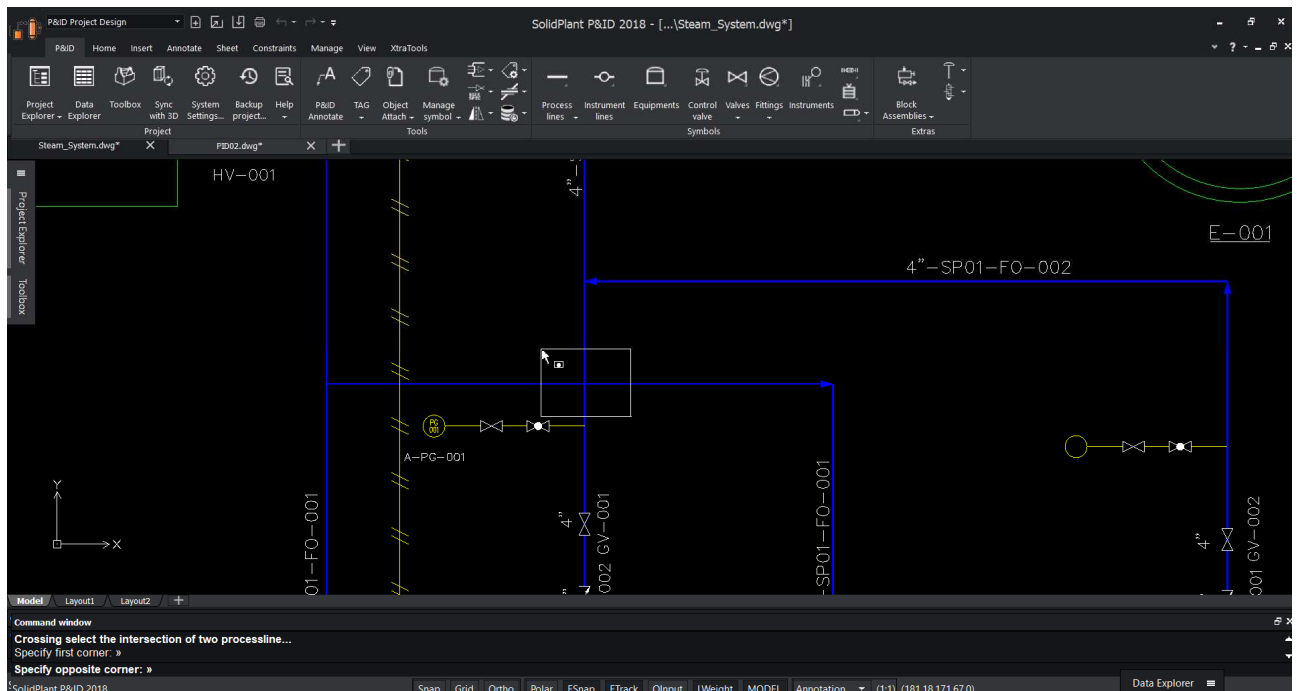

Set Vertical Break

SolidPlant P&ID also gives user the option to manually create a break where ever it is possible, using **"Set Vertical break and Set Horizontal break"** functions.

To create a break symbol on vertical line select **"set vertical break"** function.
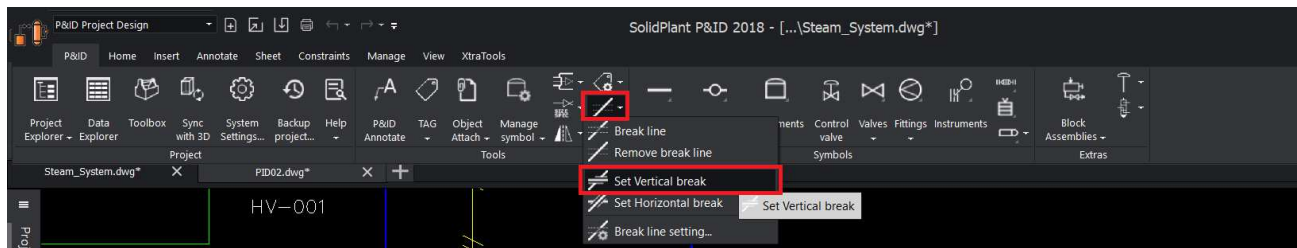
After selecting the function, use a box selection of the overlapping line.

Custom Symbol

Every industry has their own customization and representation of the symbols in P&ID. To help user/designer to import their own standardized/customized symbols, SolidPlant P&ID provides a useful function called "New Symbol" to import.

New Symbol

To import a new customized symbol, the new symbol must be in a block. To create a symbol as a block, click on Insert menu –> define block.
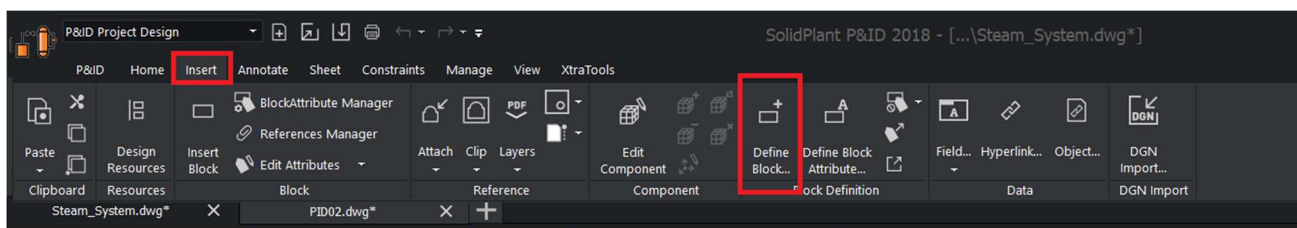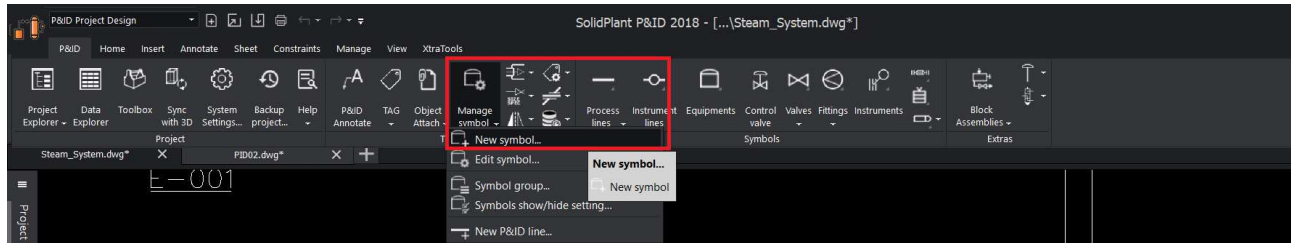

A block definition dialogue box will appear. Give the name of the new symbol, select base point of the symbol (which will be your reference point for placement), and select the entities.
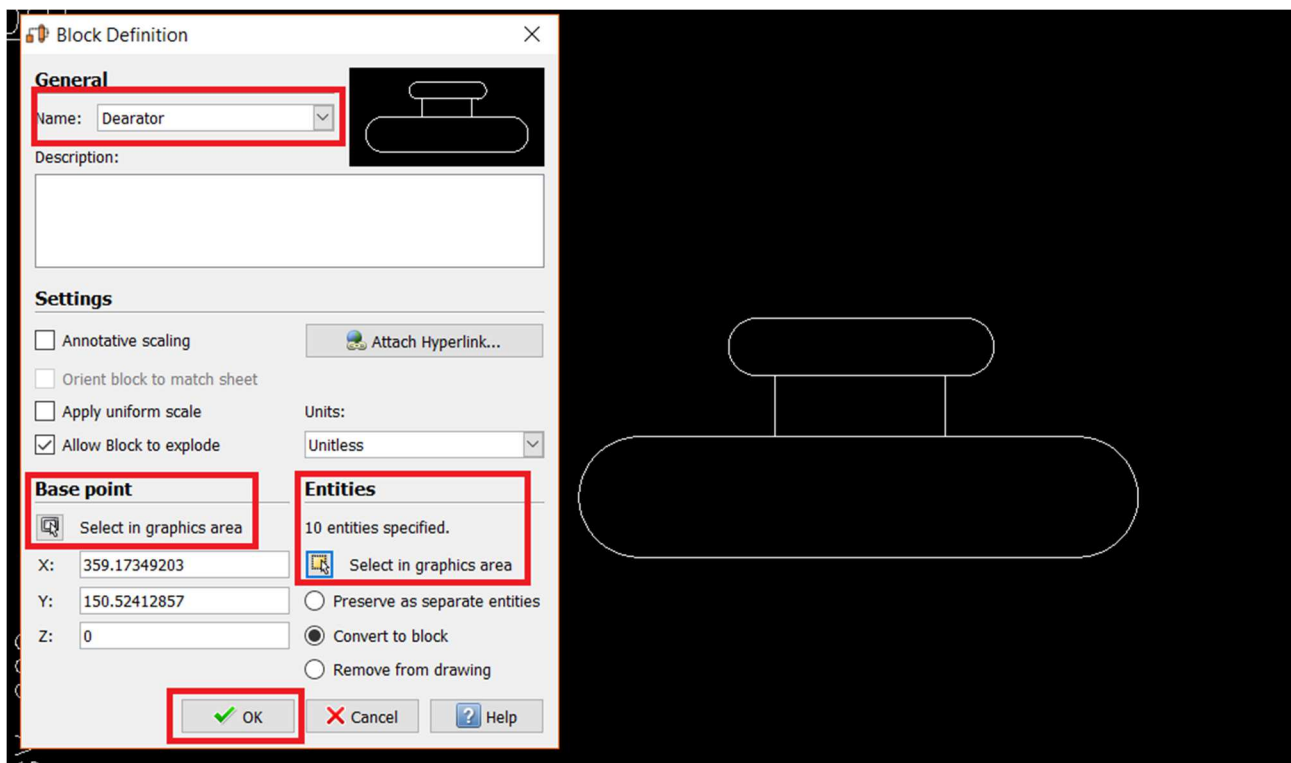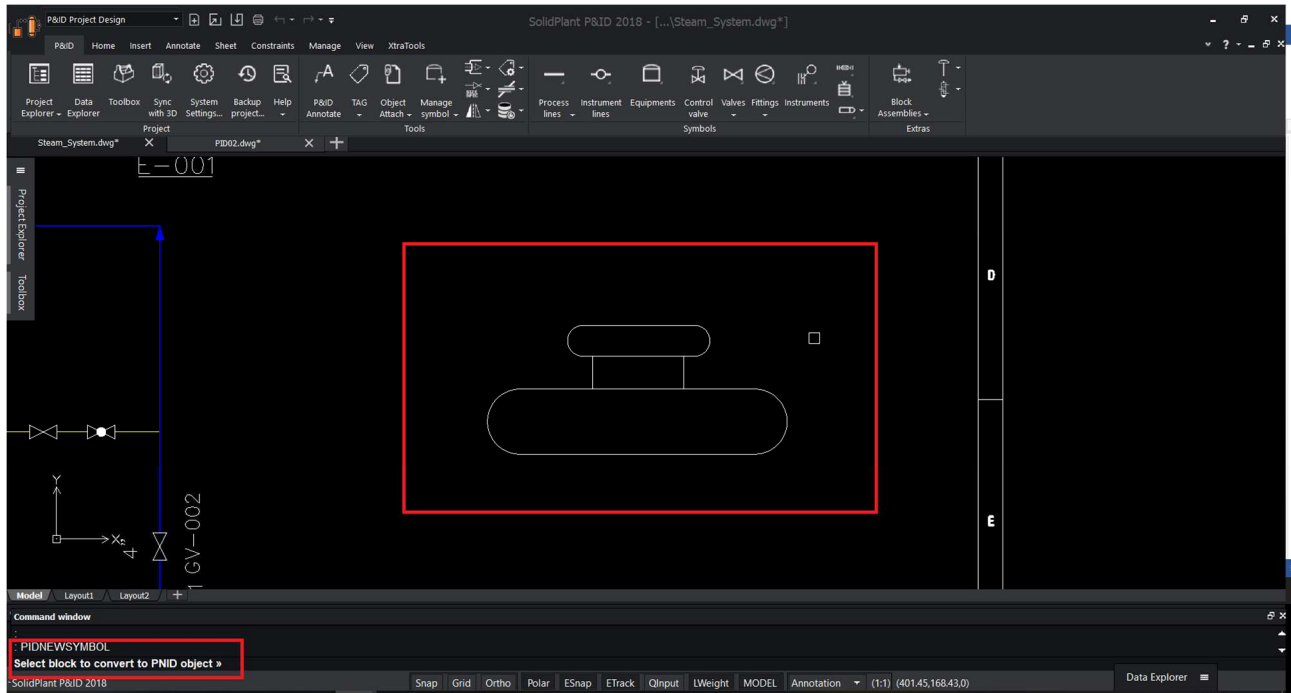

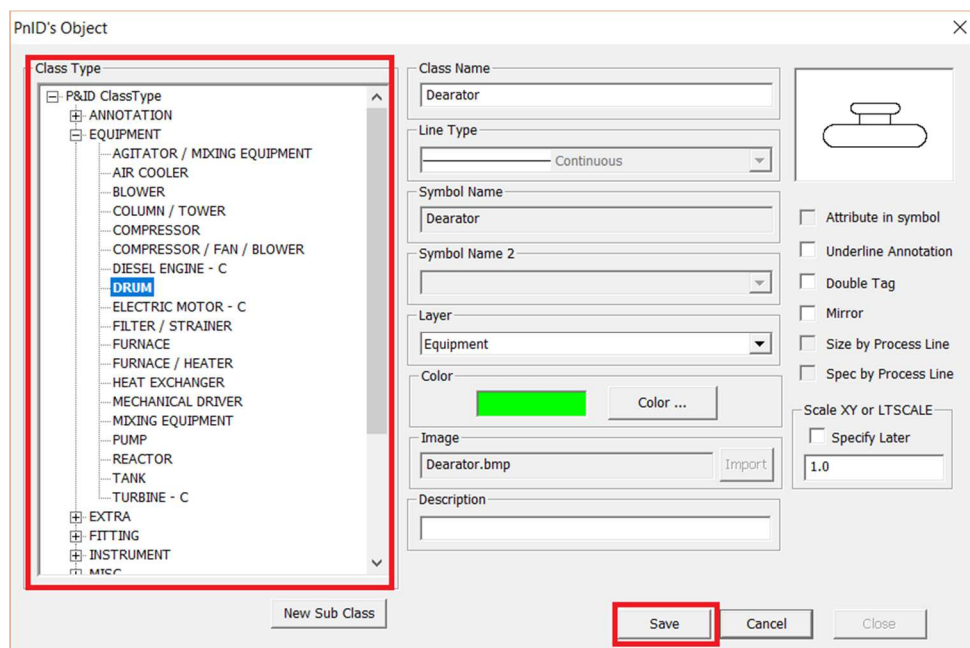The symbol will be converted into a block.

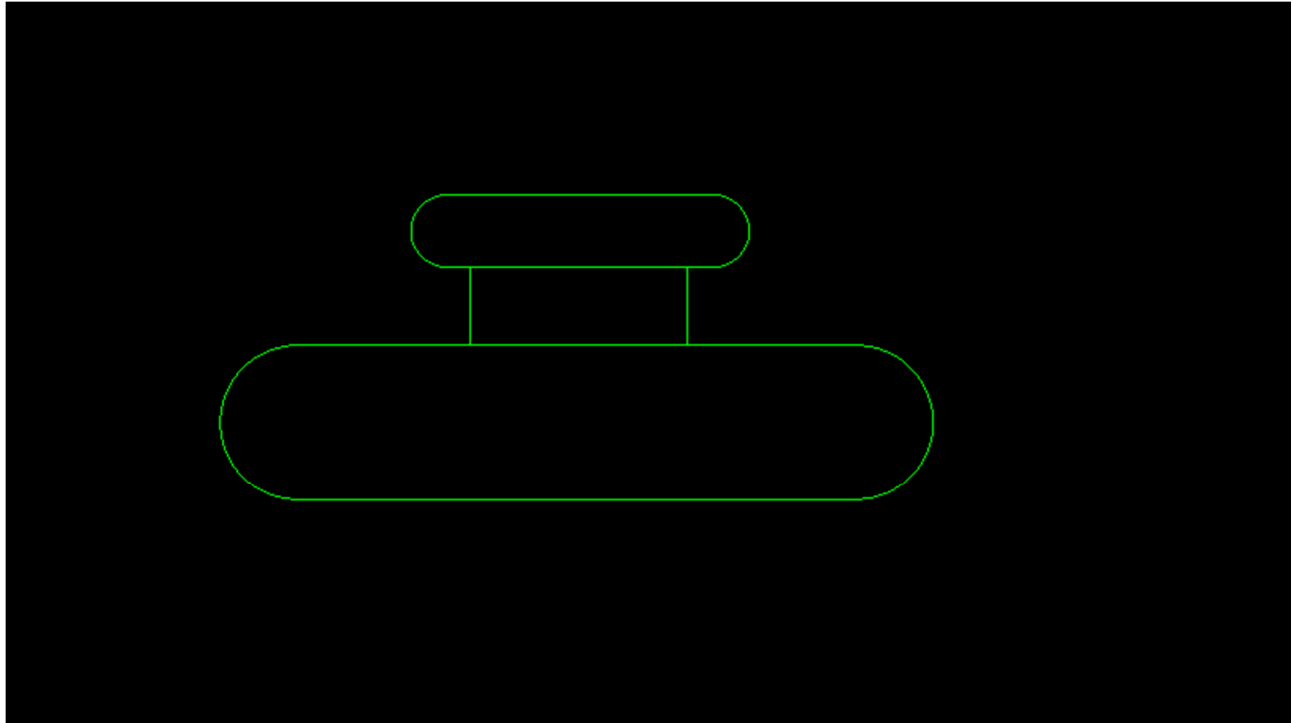Now Click on P&ID ribbon-> drop down manage symbol-> select new symbol.

Select the block to convert it to a P&ID object.

Select under which category this symbol you want to import and click "save".

The new symbol will change to the color of the category you selected.
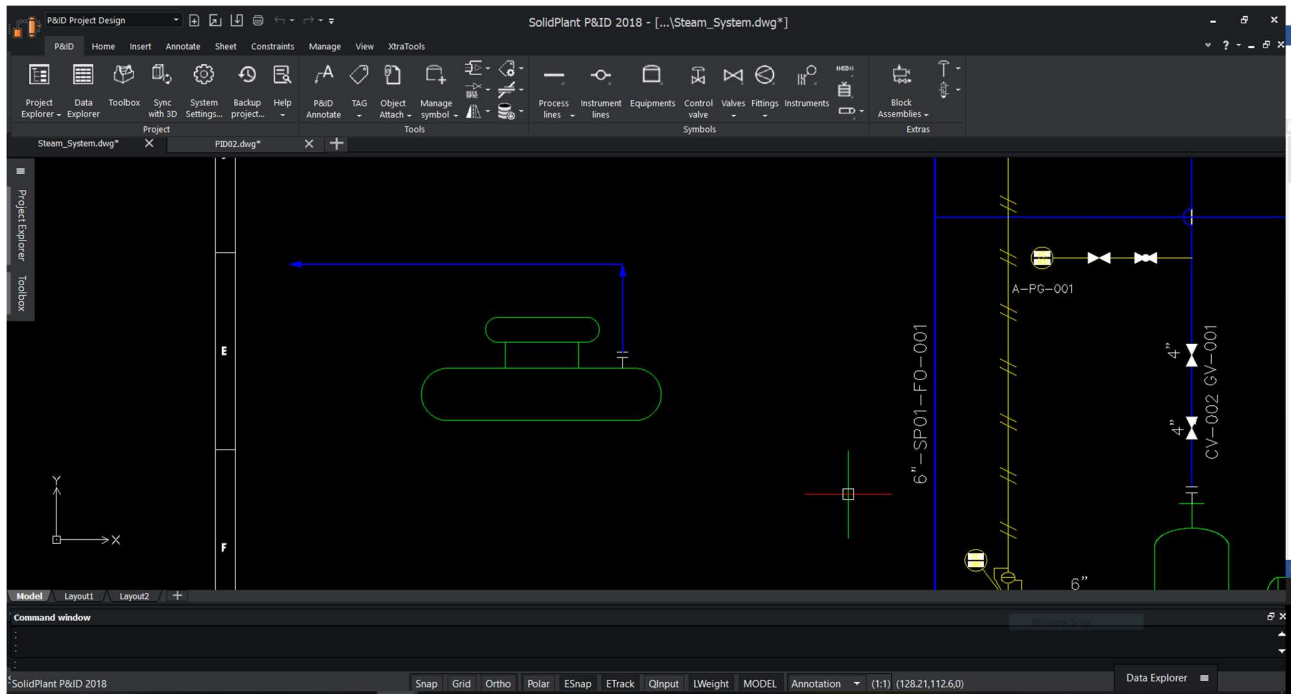

To use in the drawing, all the customized symbols will appear in the toolbox in respective tab under customized symbols. Hover your mouse on the name and you will see the preview.

Select the symbol and place in the drawing. When you connect your process line, a nozzle will be created automatically.


Tip: User can also create a new subclass type in new symbol dialogue box.

Import Library

Every industry have their own customization and representation of the symbols in P&ID. SolidPlant P&ID helps you to import symbols customized for specific company or client needs directly into drawings. Import custom made symbols used in one project to another. With the import library function, you can open the database file that contains all the previously saved customs symbols. From that file you can select any symbol and copy them to destination, being your project.
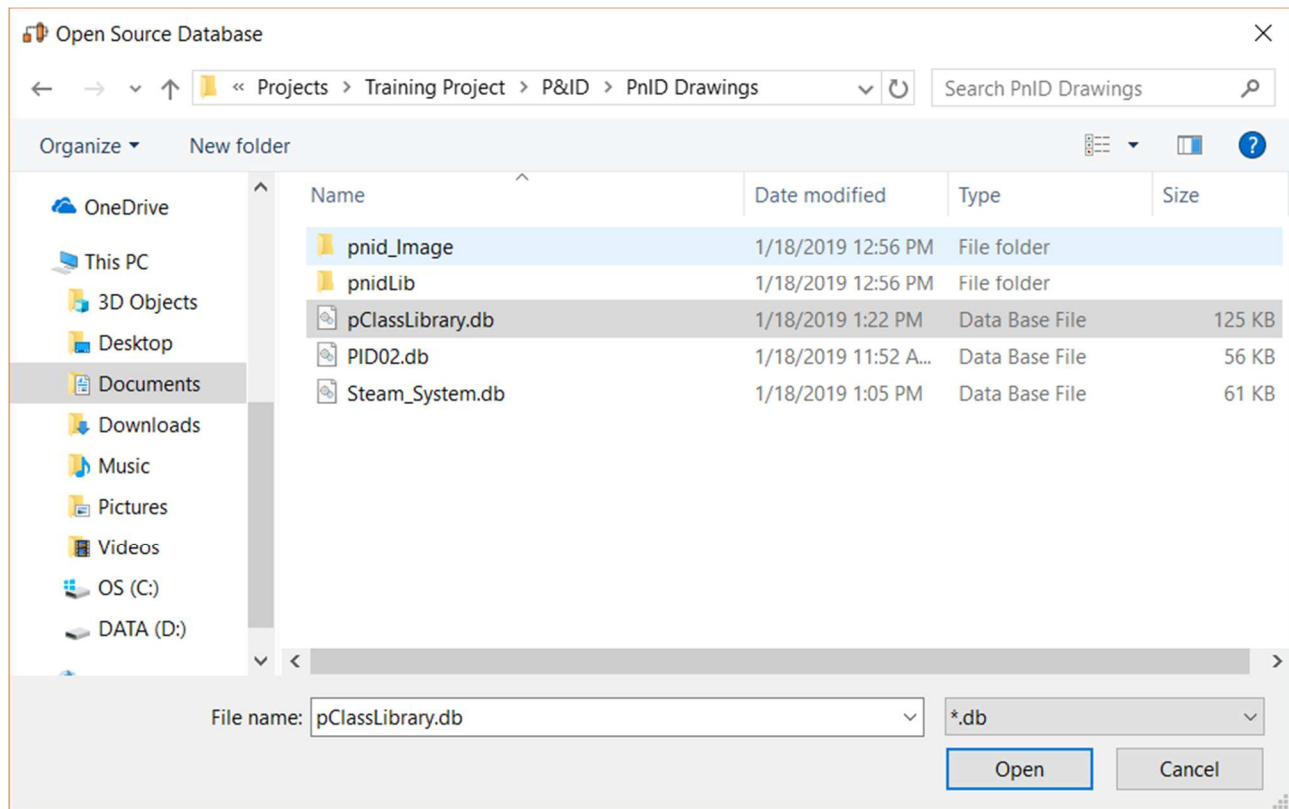
Import library

To import all the customized symbols from one project to another, drop down the settings in the P&ID ribbon and click on Import library function.
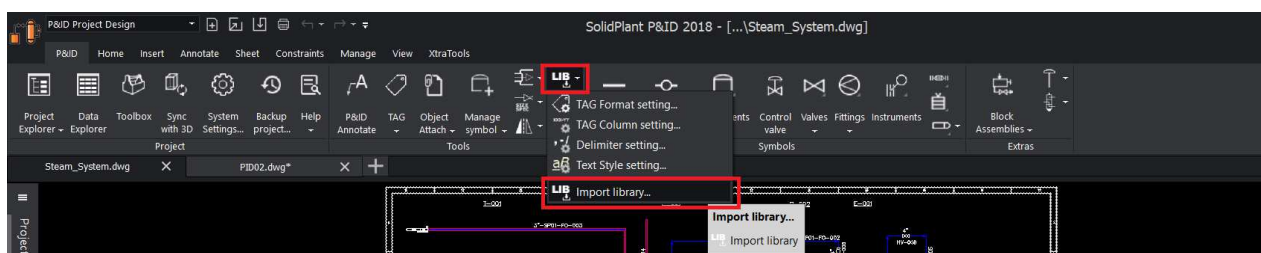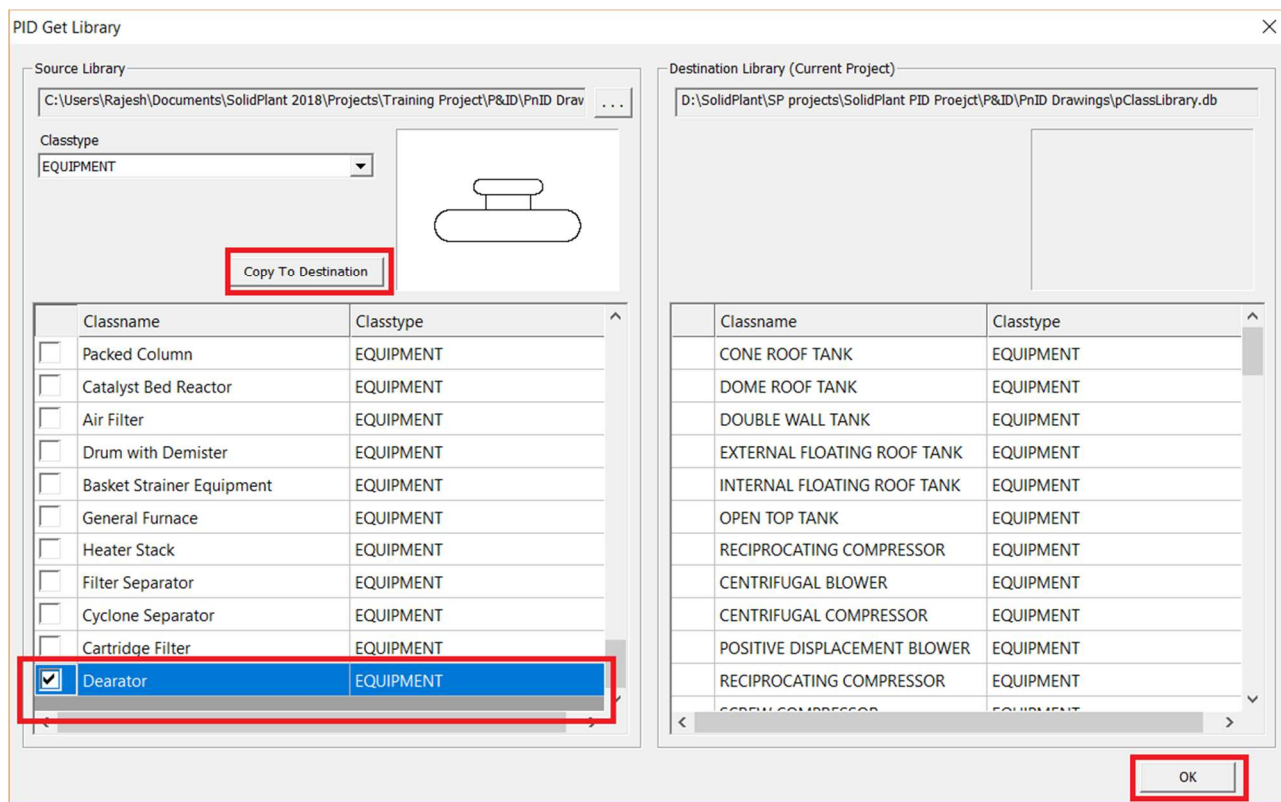

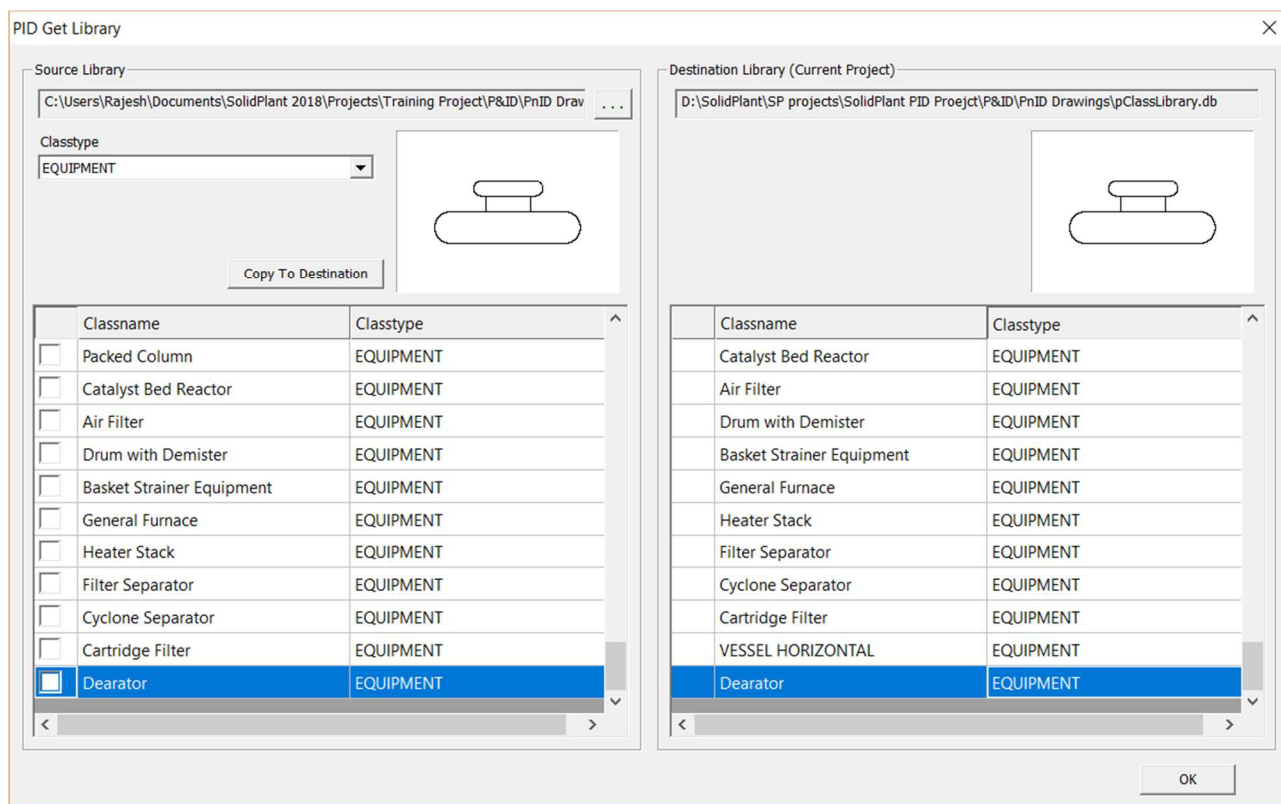After you click on the function a dialogue box will appear.
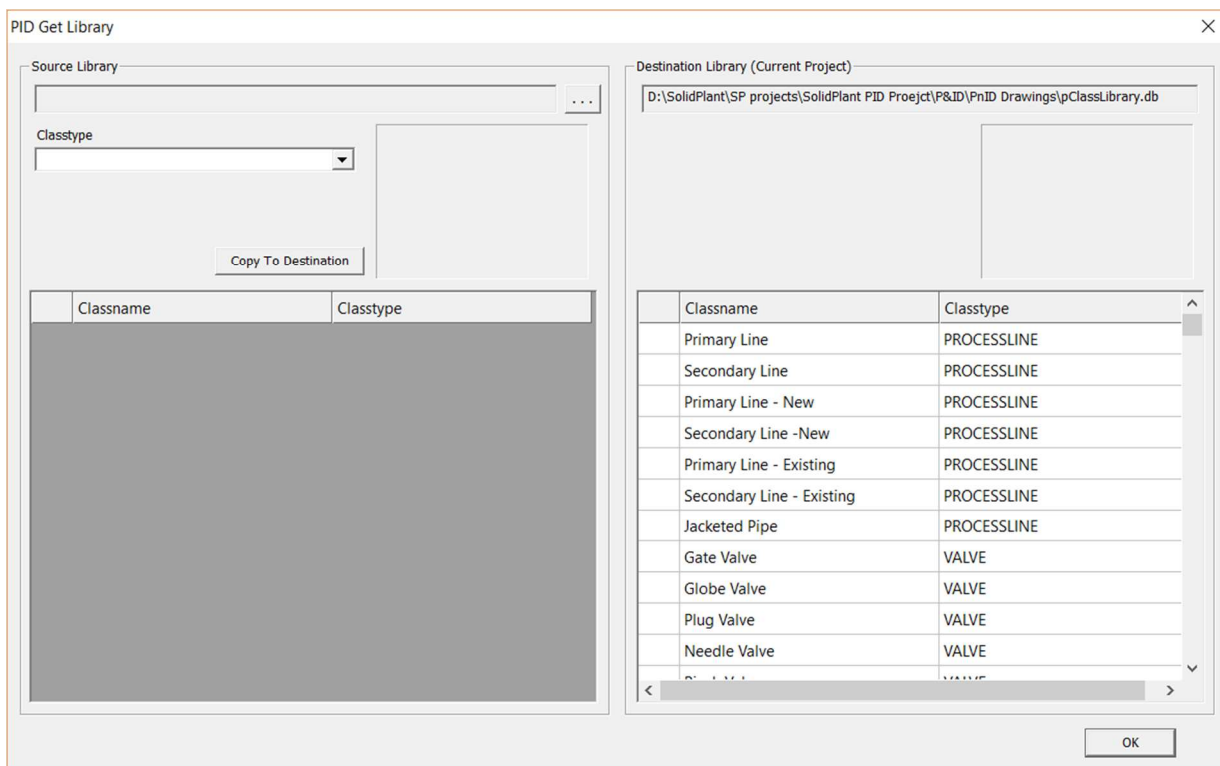
Select the source library file, browse to any SolidPlant P&ID project folder and select the pclasslibrary.db file

Select which symbols you want to copy from that project, and click on "copy to destination" button.

The customized symbol file will be copied to your current project.

Custom Annotation

Easily create, edit, and customize tags and annotations in industry-standard formats. Simply click on the Equipment's, lines or component you want to manage the tag for. In SolidPlant P&ID it's very easy to customize annotations and place them in your drawing. You can create any number of customized fields for equipment, fittings, lines, etc. Different text colors will help you to quickly identify the properties of the items in your drawing. Dynamic text fields will use the data from the drawing to be placed, reducing input mistakes.

New Custom TAG

To display the customized fields we added in column settings earlier, we use 'New Custom Tag' function in Assign tag.
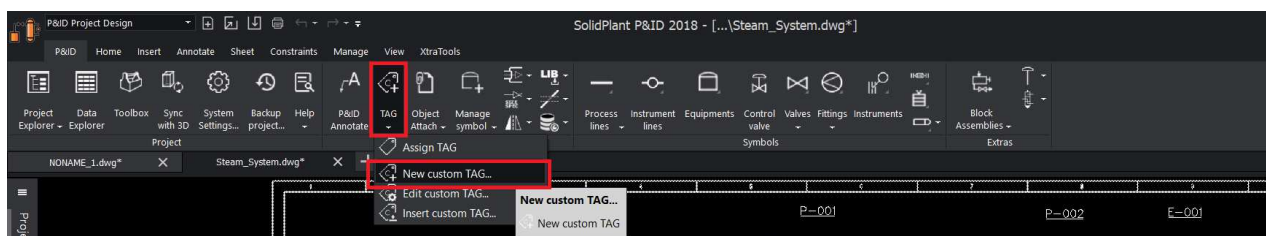

Custom annotation setting dialogue box will appear. Give the name and click on 'add' button.
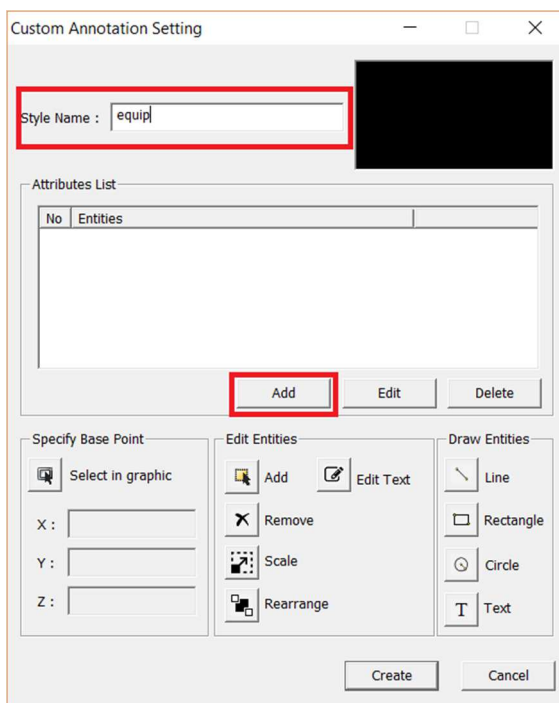
Custom tag setting dialogue box will appear. Select equipment in the attribute format, scroll down and select capacity and > button to bring it in the project, and click place button.
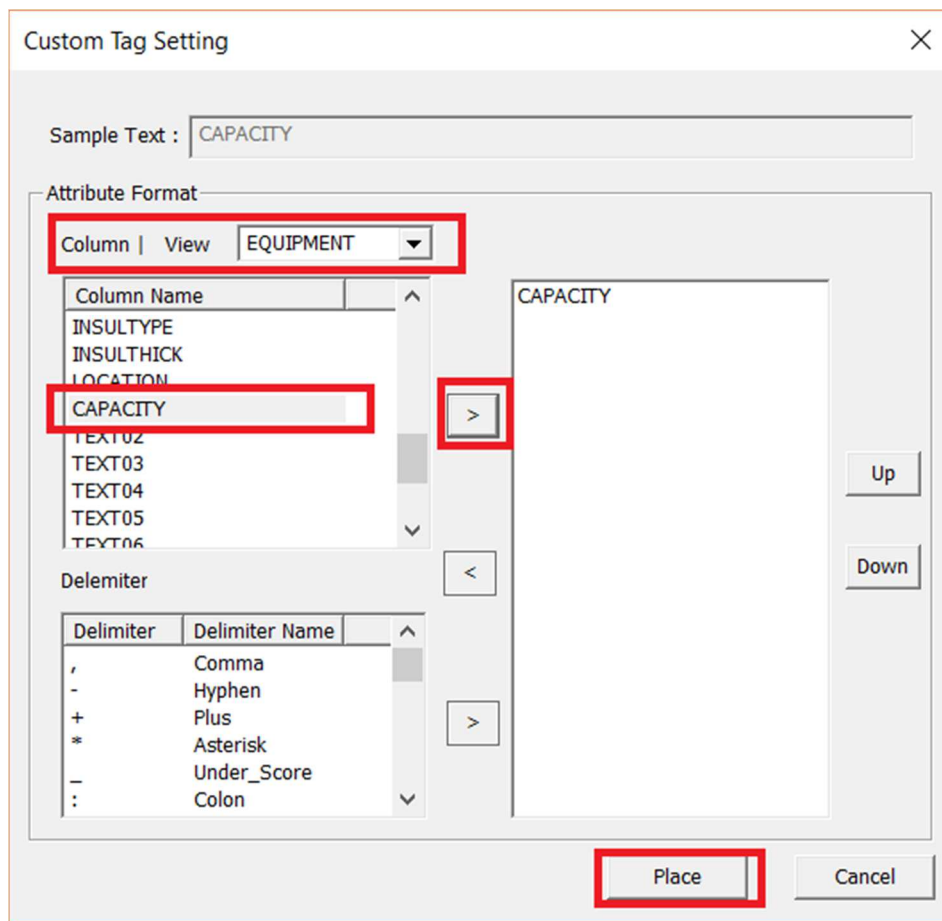

A properties dialogue box will appear. Here you can select font style, color, alignment, height and width of the text.
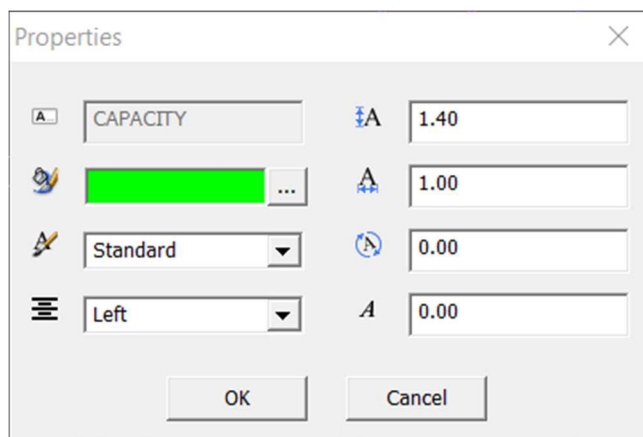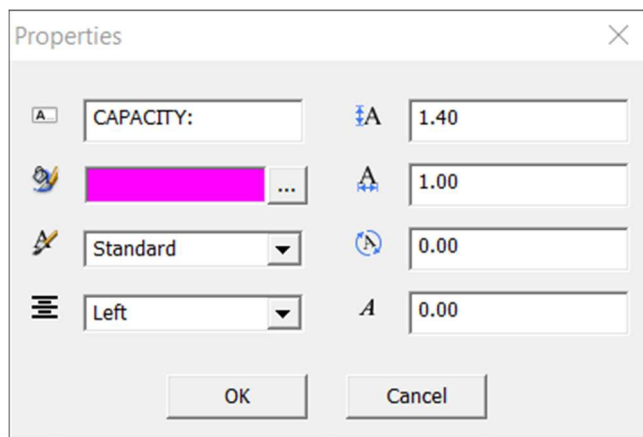

And place the text anywhere in the drawing.

To display the text lines under each other, you need to select them one by one. Texts in custom annotations are either one of two types: static and dynamic texts. Dynamic text will reflect the assign tag text. To add static text in front of dynamic, click on 'text' button.
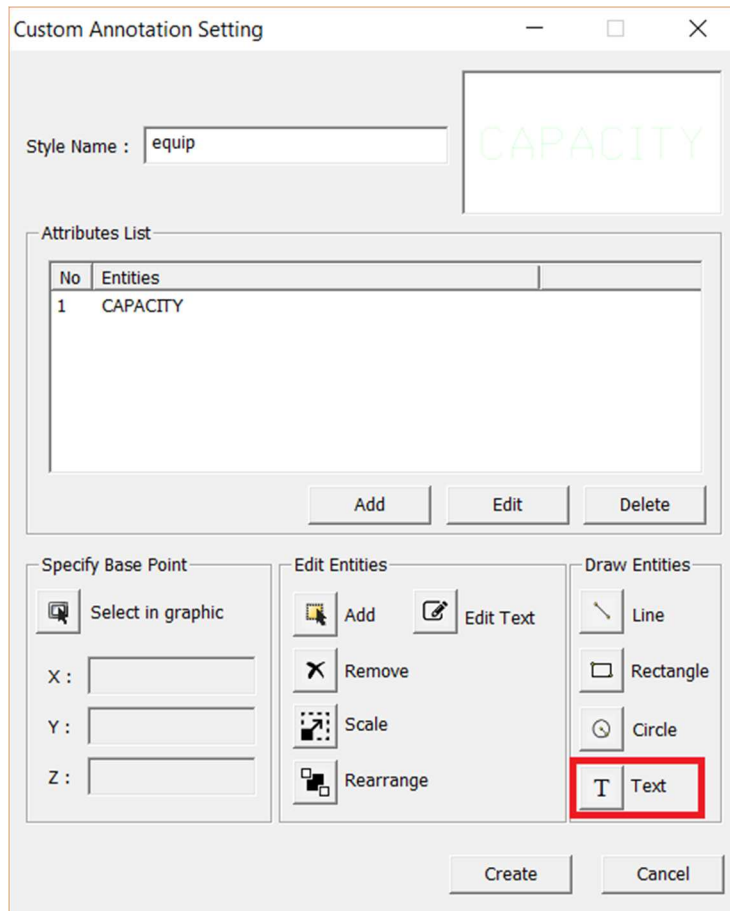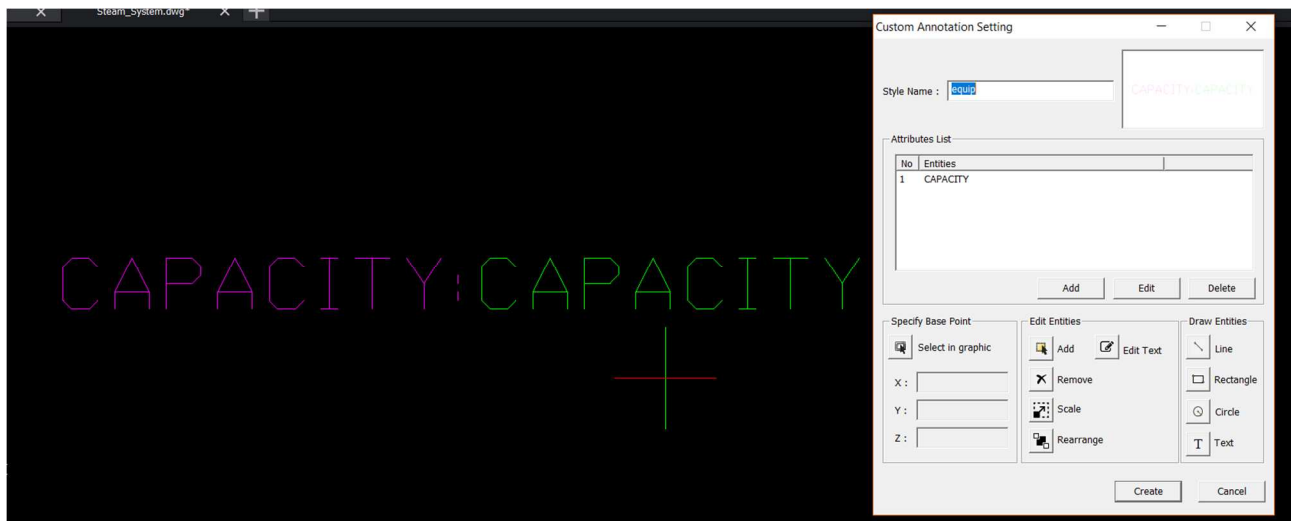

In the properties dialogue box, enter the customized text you want to display in the drawing.

And place it in the drawing sheet.
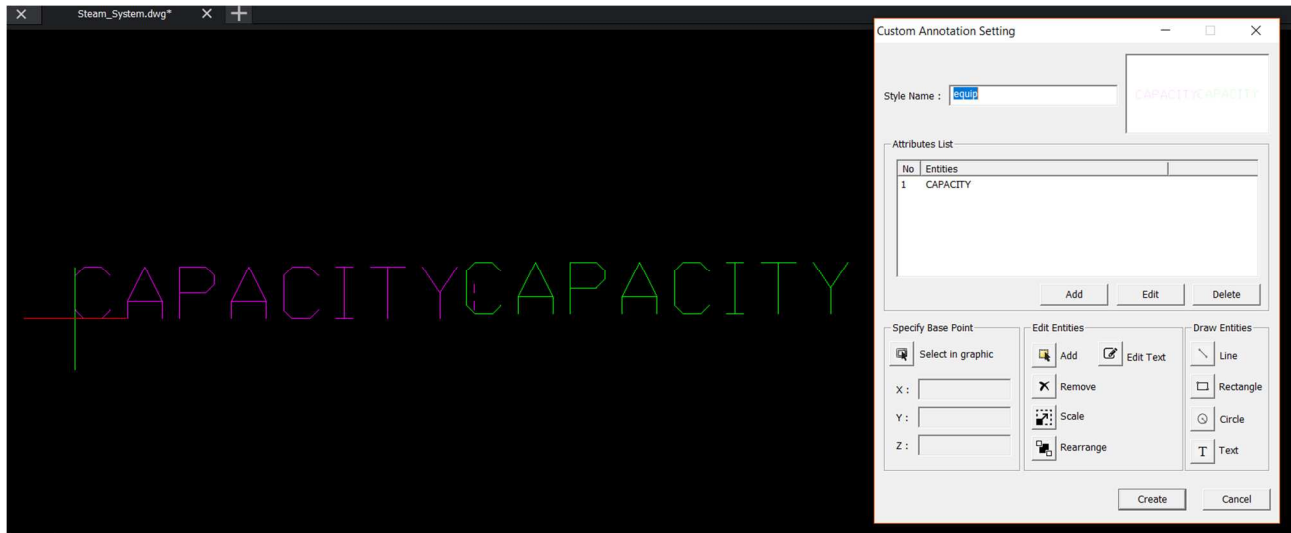
You can use 'rearrange' button to arrange the text.

Select the base point in the drawing. This will be your reference point to place the custom tag in drawing, and click on create.

Custom Annotation Setting

Style Name : equip

CAPACITY:CAPACITY

Attributes List

No	Entities	
1	CAPACITY	

Add   Edit   Delete

Specify Base Point

Select in graphic

X : -81825735

Y : -2000276301

Z : 0

Edit Entities

Add   Edit Text

Remove

Scale

Rearrange

Draw Entities

Line

Rectangle

Circle

Text

Create   Cancel

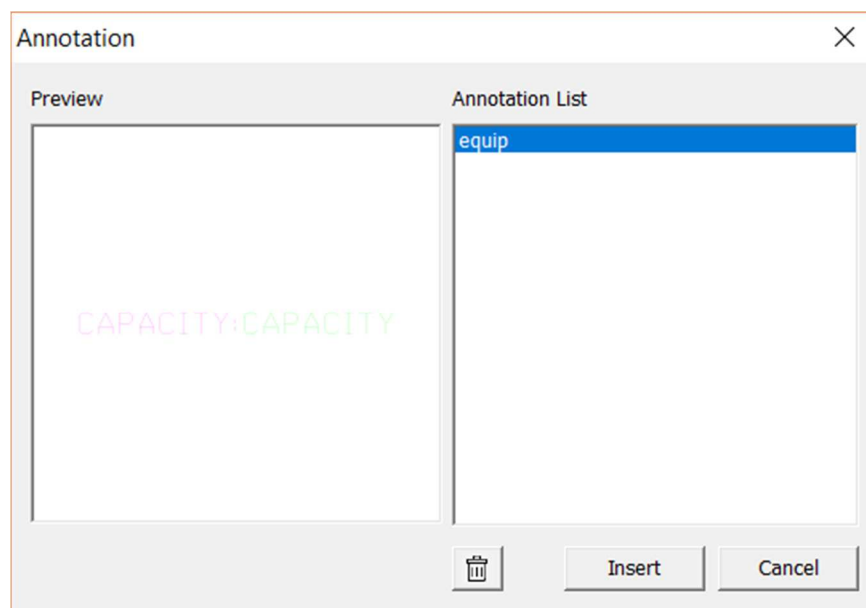The custom annotation will be successfully created in the database and you will get an info box.

Custom Annotation created.
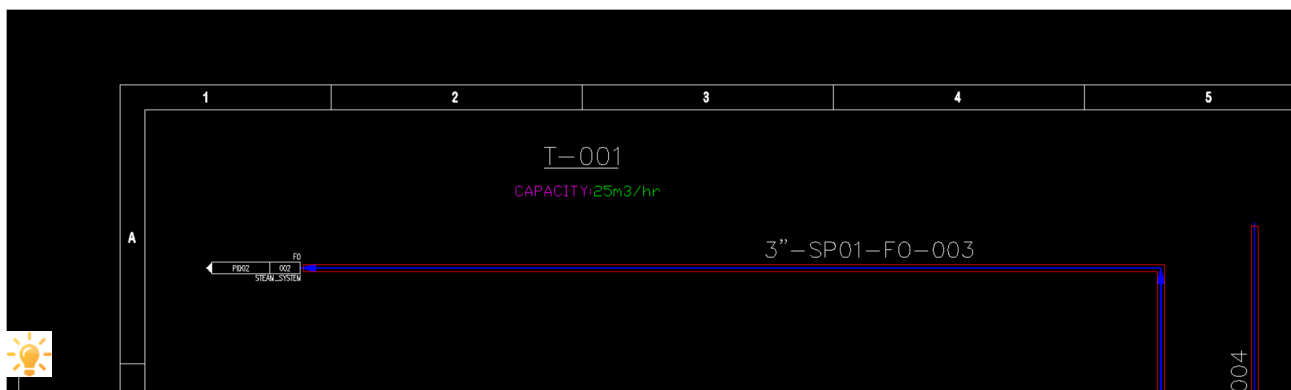
OK
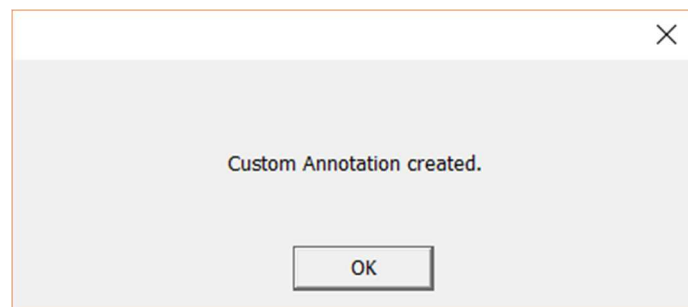
Insert Custom TAG

To display/insert this custom tag in the drawing, select **"Insert Custom tag"** from Tag drop down.
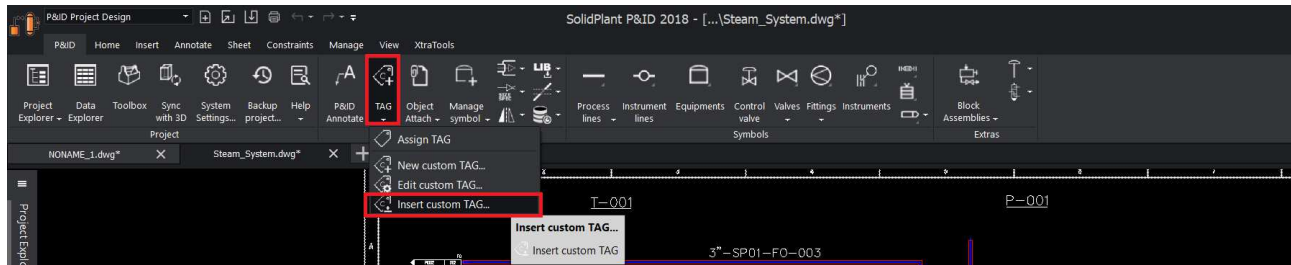
Select from the annotation list and click on **"insert".**

Select the equipment outer boundary and place it anywhere in the drawing.

Tip: To edit any of the created annotation styles, use **"Edit custom tag"** function from tag drop down.

Data Explorer & Export BOM   7

We use the Data Explorer to view, edit, and manipulate component and line data, and to generate reports. The Data Explorer helps you to zoom to particular objects in the drawing. The Data explorer displays all the data related to symbols and components used in the drawing.

Export reports using Microsoft® Excel® spreadsheets (XLS/XLSX).

There is a high level of repeated information on a P&ID drawing and with the capabilities of the SolidPlant P&ID Data Manager, speed and accuracy is increased.

Using SolidPlant P&ID software means that you can make the schematics and drawings faster than ever before. Everything you need is included in the software. Being able to create reports means you can make purchasing lists, so your suppliers can produce prices for the equipment you need much more quickly. This enables you to deliver your quotations much earlier than you would have done before.
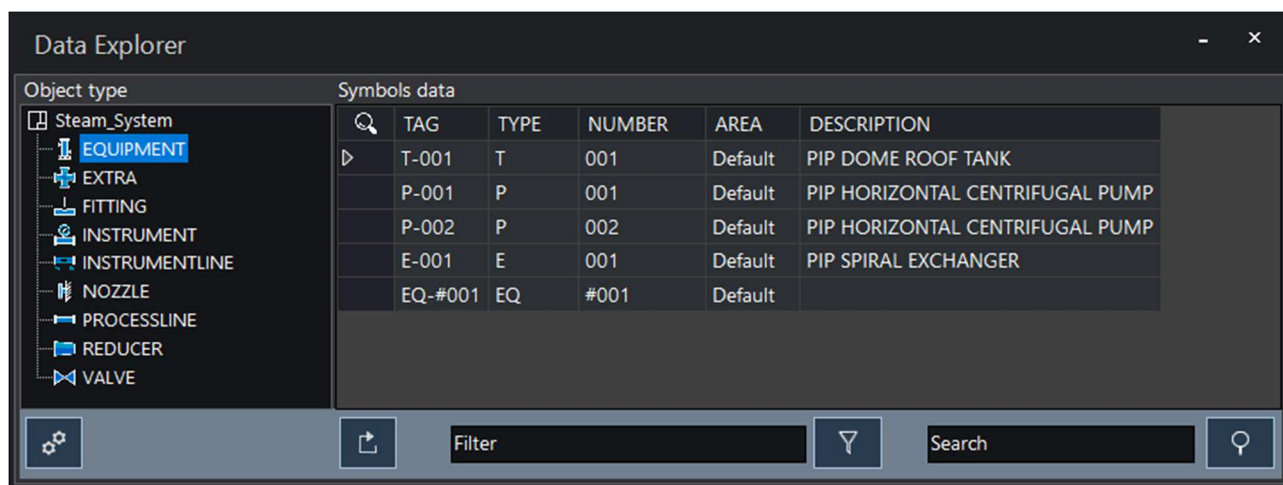
Data Explorer

To access the Data Explorer, click on the data explorer function in the P&ID ribbon.
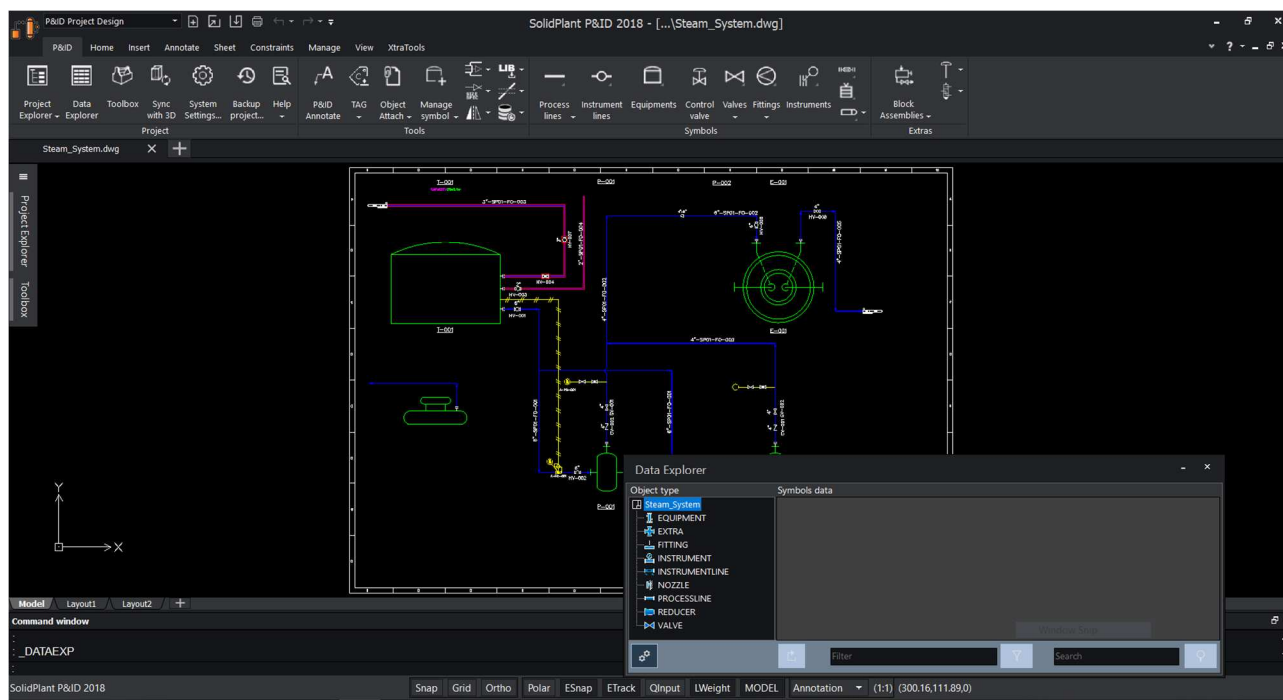

The data explorer will pop-up at the bottom of the screen, with each discipline categorized, and all the relevant tags sorted based on their object type.

Example: all the equipments under equipment, lines under process line etc.
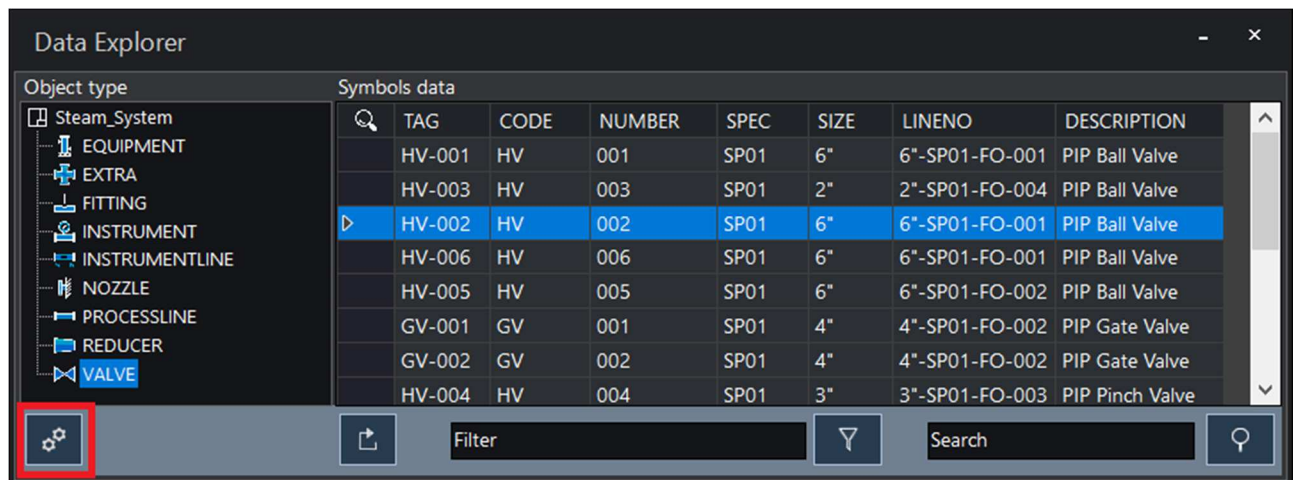

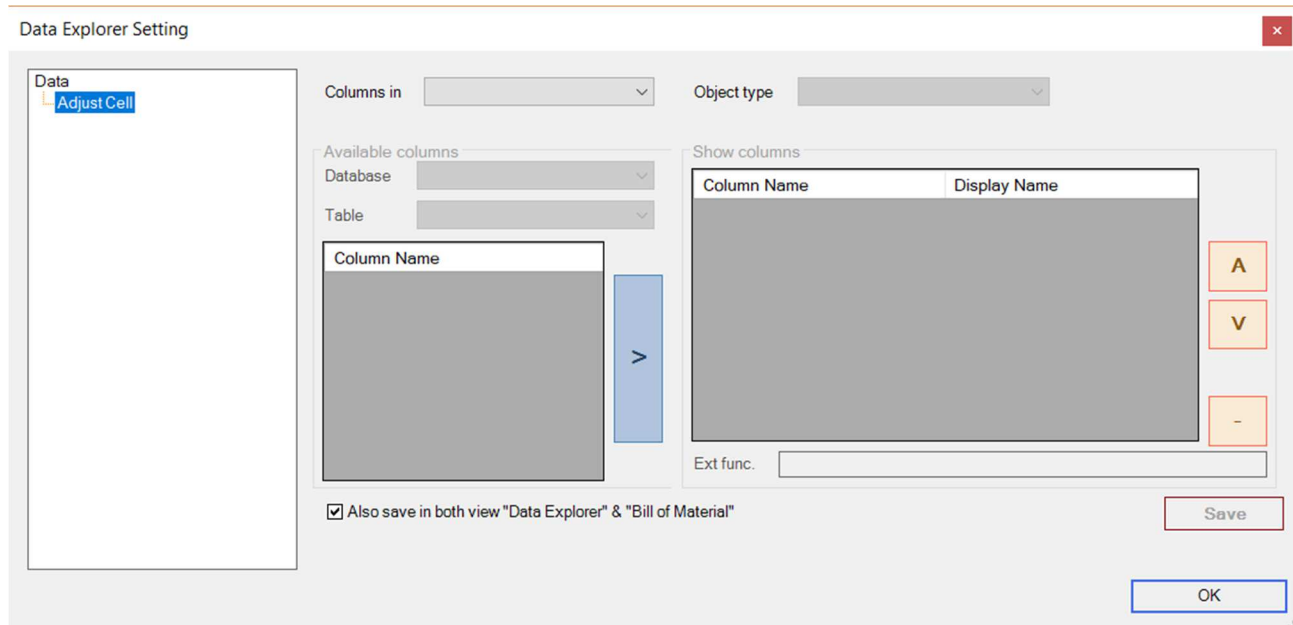To locate any of the components in the drawing, select the type and double click in the magnified field in front of the tag number. That component will appear in the drawing area.
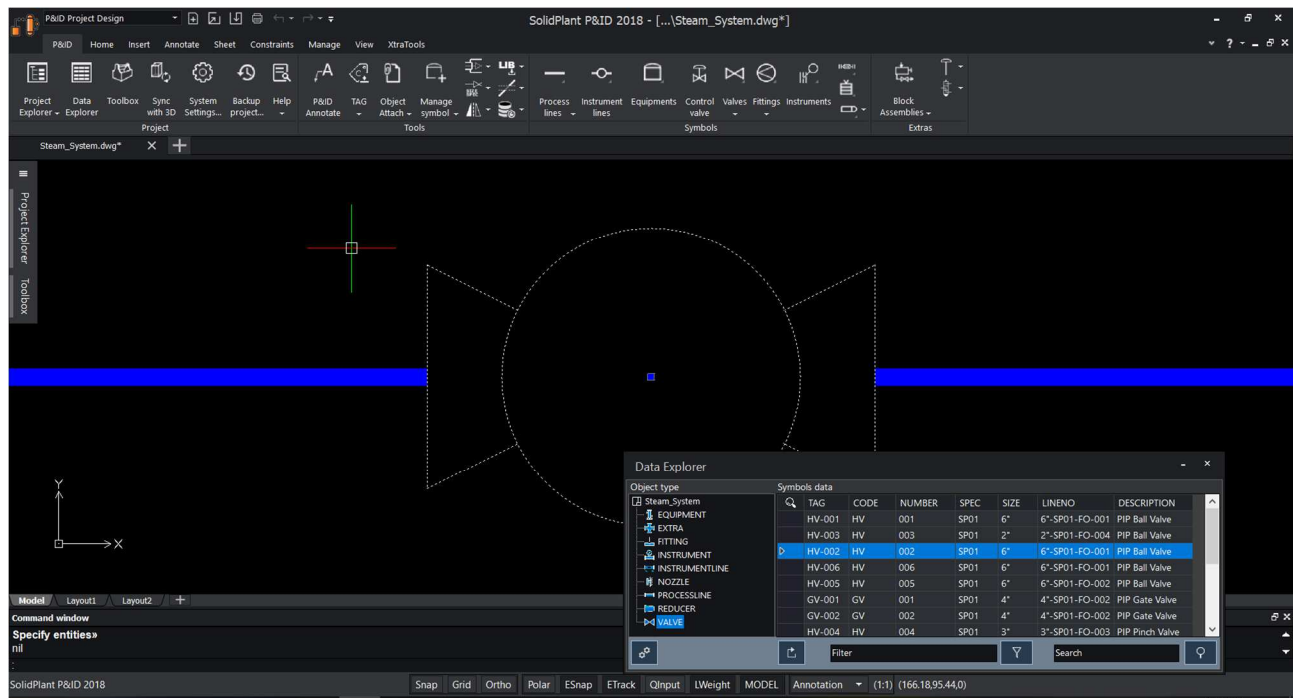
Data explorer settings

To display customized fields in the data explorer, we use data explorer settings.

Click on the gear icon on data explorer.
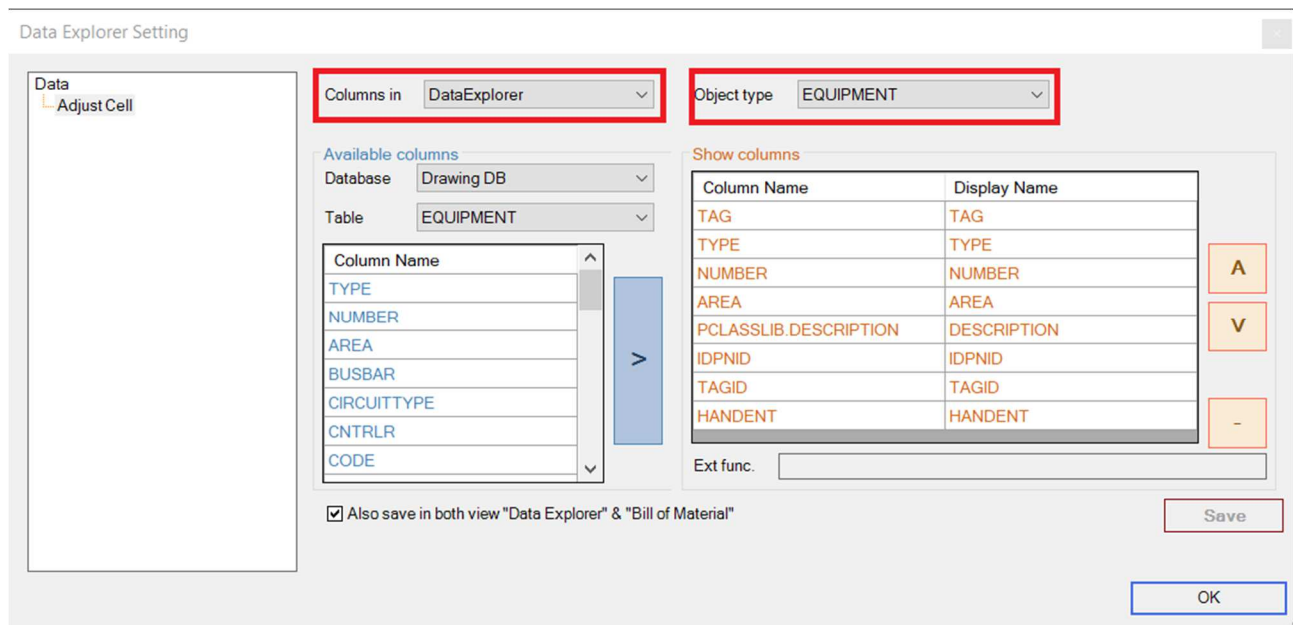
Data explorer setting dialogue box will appear.

Select DataExplorer in the column and object type is equipment.

Earlier we created capacity in the column setting. To bring in that column to be displayed in the data explorer, scroll the column name, select Text01, and use> button to show in the data explorer.
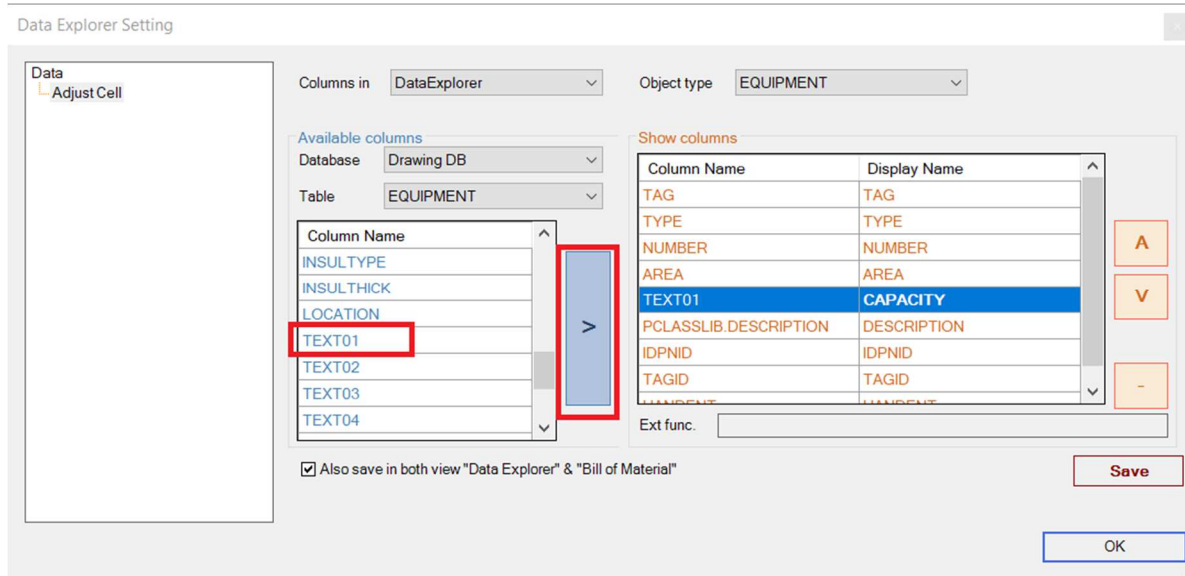
Click on "save". You can choose to save these settings in the bill of material too.
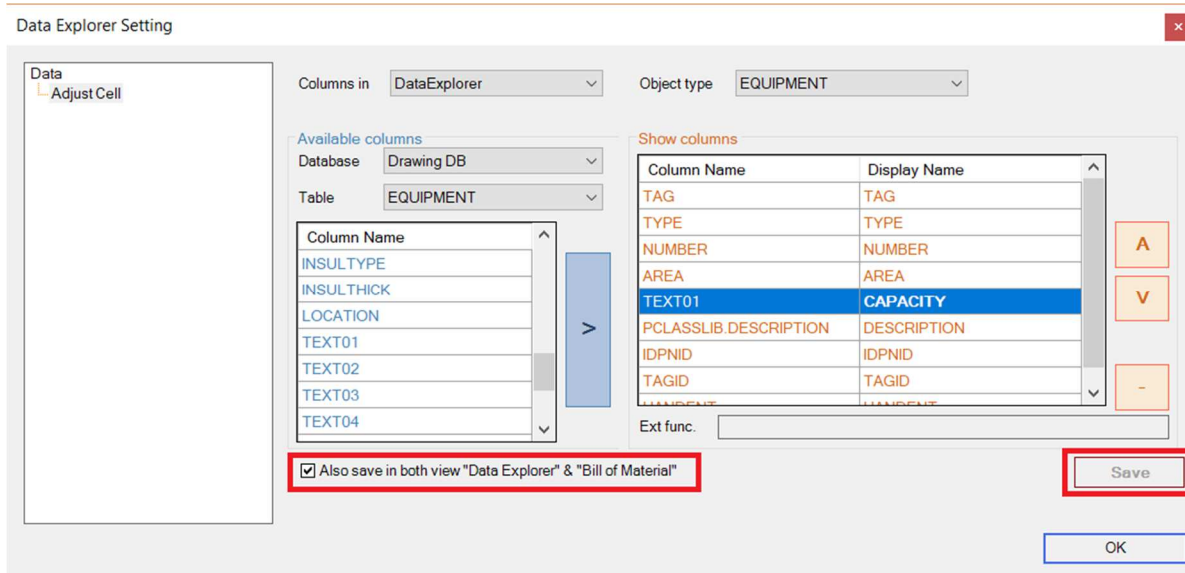
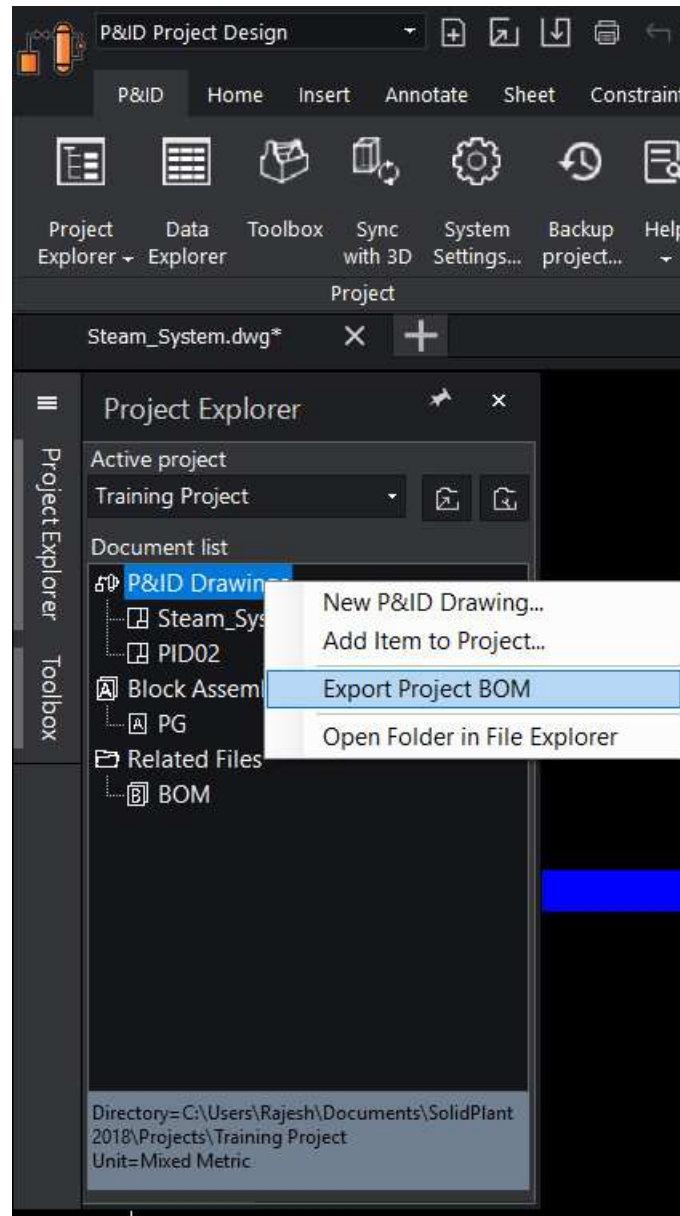The Data explorer will be updated with the capacity field in the equipment tab.
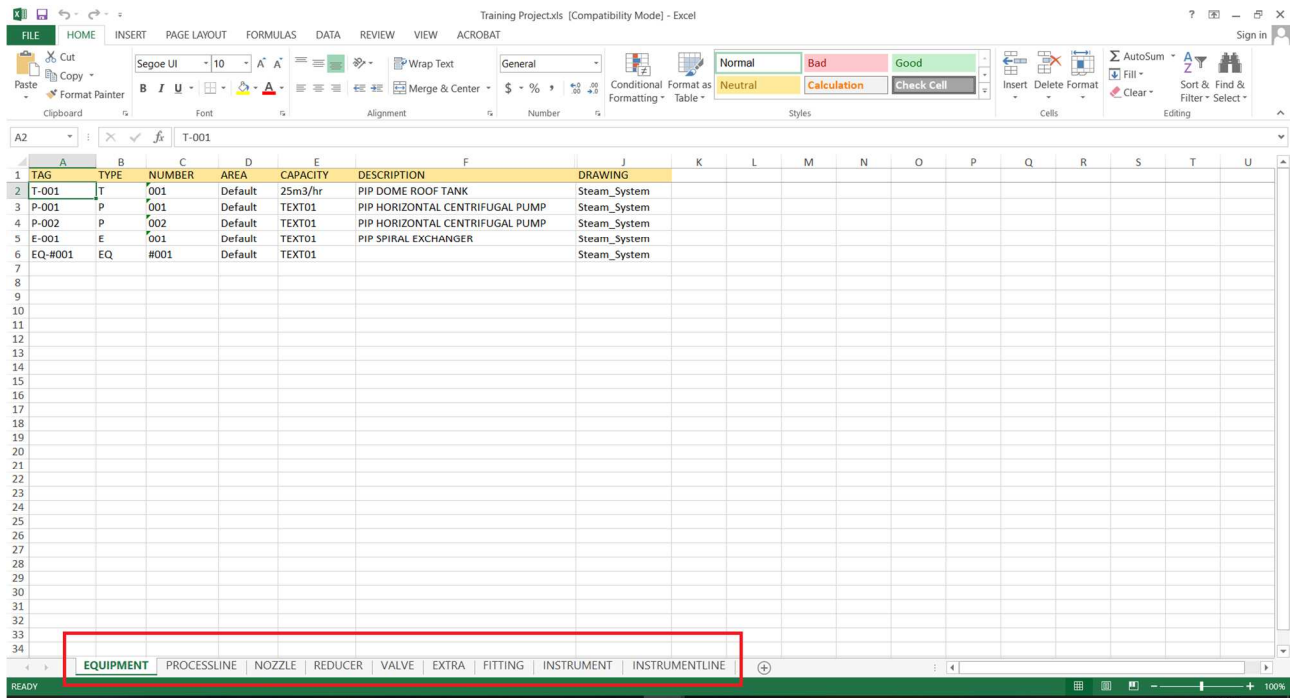
SolidPlant P&ID
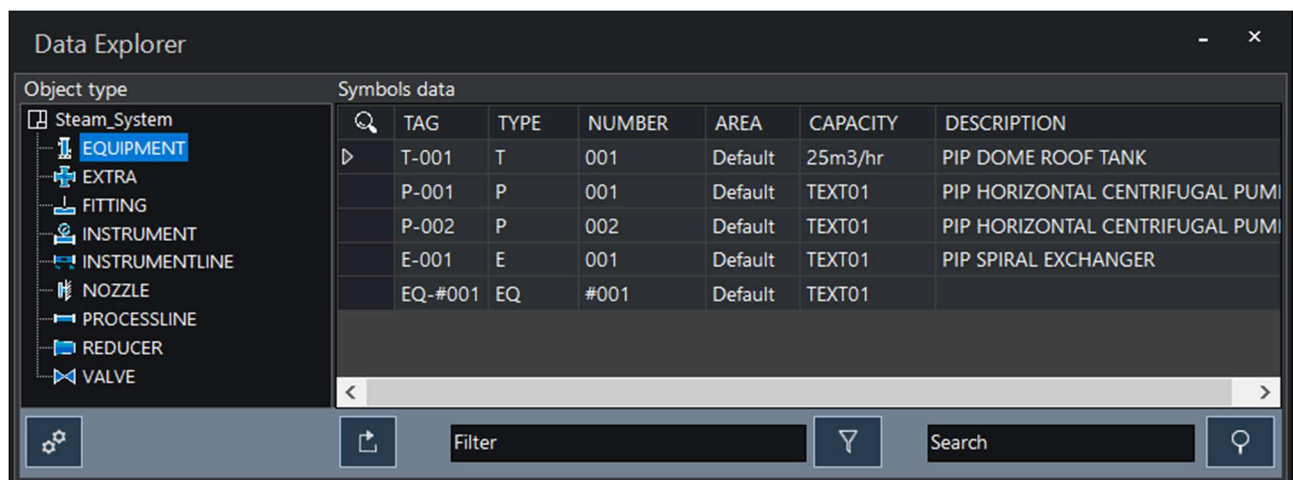
Export BOM

Bill of Material or P&ID data list can be exported for single drawings and also for the entire project. No matter how many drawings you have in your project, you can export project BOM with just one click.

To generate BOM, click on project explorer, right click on PID drawing-> export project BOM

This will open an excel file with all the data export in different sheets respectively.

Tip: To export BOM of a drawing sheet, right-click on the drawing name and click on **"export BOM".**
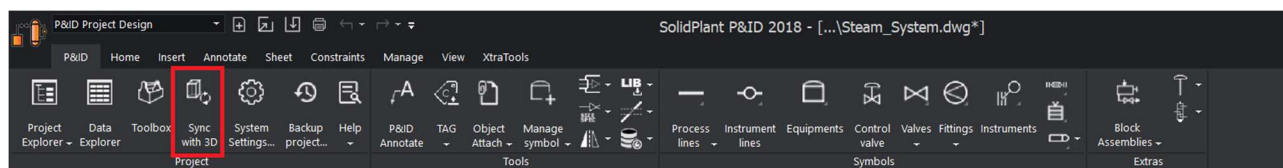
Sync to SolidPlant3D   8

Synchronization of P&ID data to SolidPlant3D

Easily report, edit, exchange, and share project engineering information, and know the impact of external data updates for better management. Export data directly to SolidPlant3D. Quickly sort and organize information for easy referencing. Enhanced change management, viewing, and editing functionality help ensure that nothing slips through the cracks.

To sync P&ID project with SolidPlant3D, SolidPlant3D should be installed on the same machine.

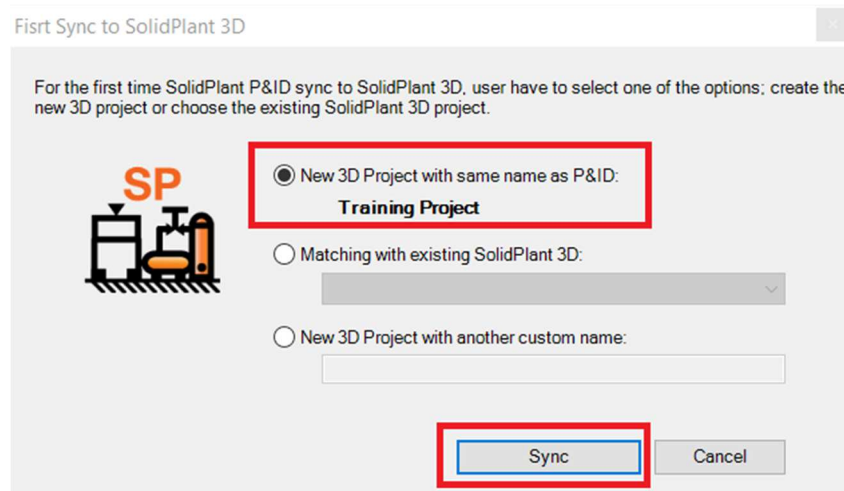Click on 'Sync with 3D' function in P&ID ribbon.

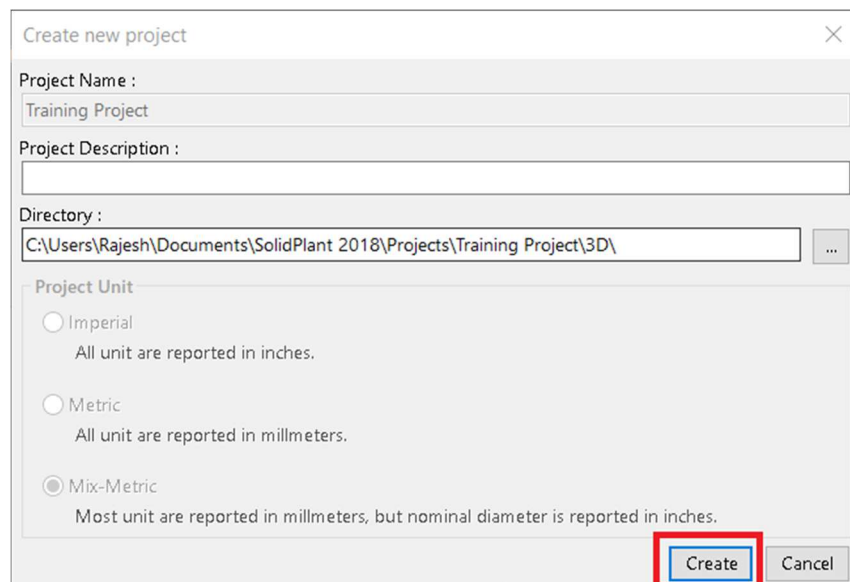Sync to solidplant3D dialogue box will appear.
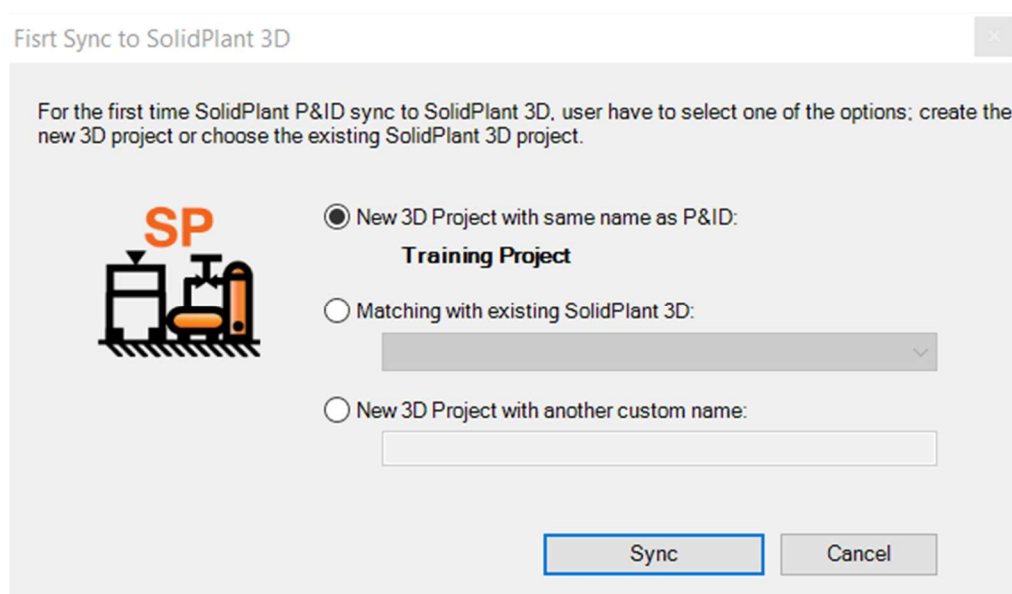
A P&ID project can be synchronized with 3 options:

    i.   Project with same name

   ii.   With existing 3D project
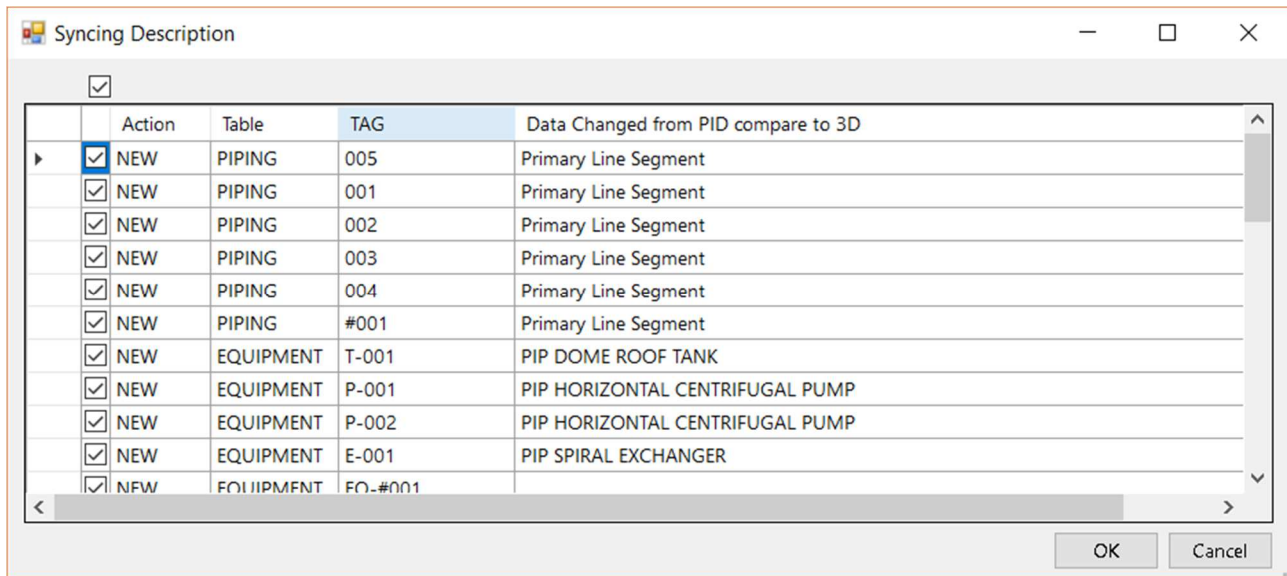
  iii.   With custom name

User can choose which option they want to use, and click on sync button. Here option 1 with the same name is used.
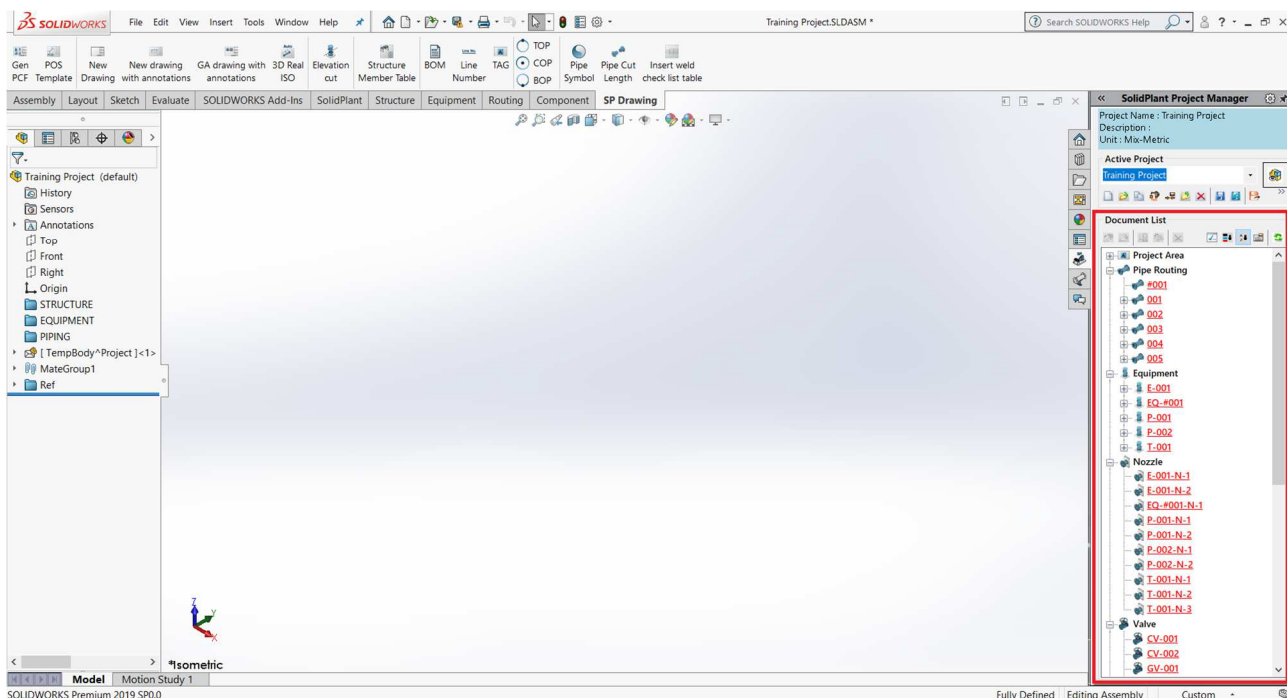

SolidPlant3D will open automatically along with SolidWorks, and shows a new project dialogue box. User can change the project directory if wanted, then click on "Create" button.
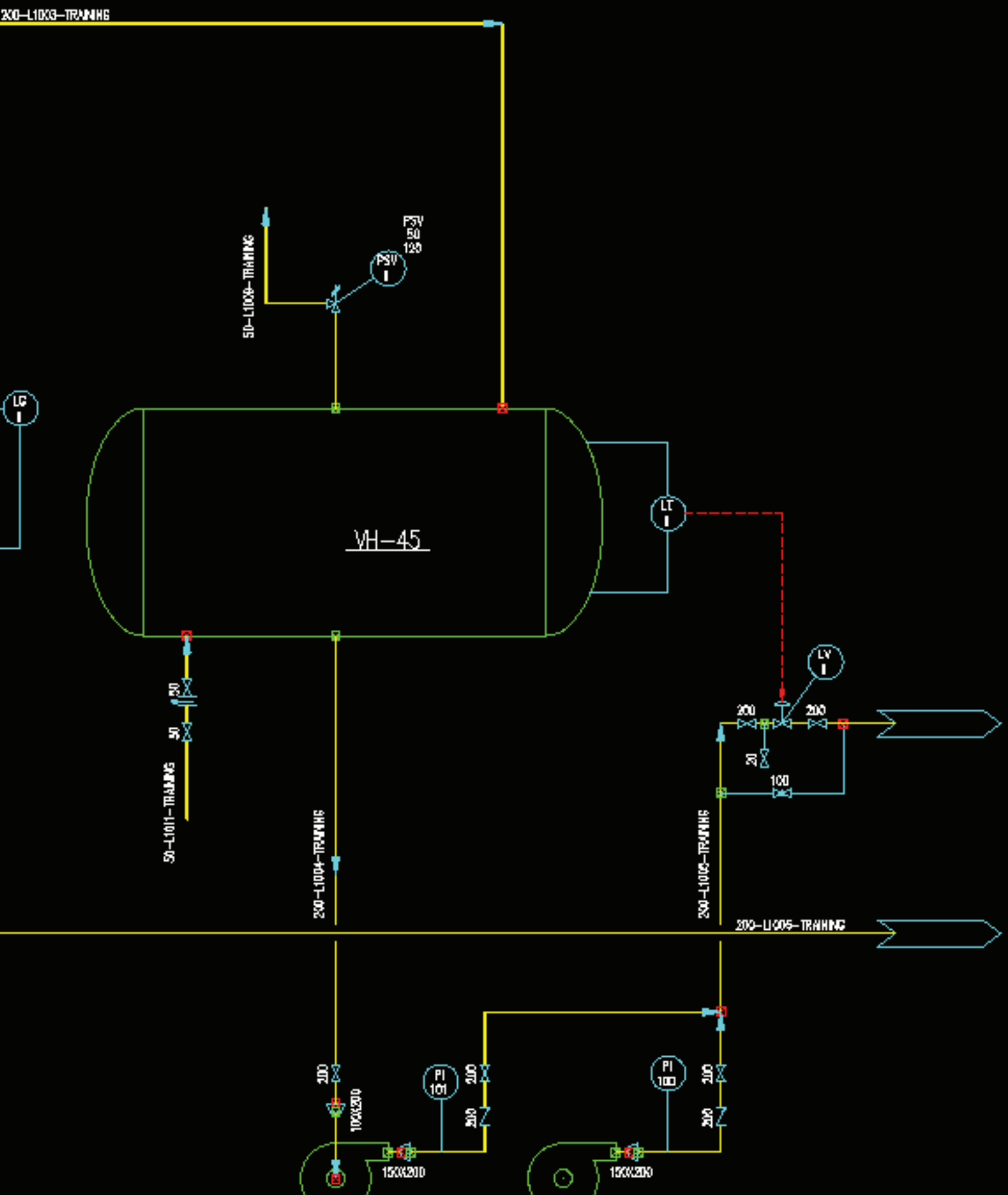
After creation, the database will be created and the import tag dialogue box will appear with all the data.

After you click on "OK", all the data will be imported into SolidPlant3D project.

200—L1003—TRAINING

50—L1008—TRAINING

PSV
50
120

PSV
1

LC
1

VH—45

LT
1

LV
1

200   200

20

100

50

50

50—L1011—TRAINING

200—L1004—TRAINING

200—L1006—TRAINING

200—L1005—TRAINING

100

100x200

PI
101

200

200

150x200

100

PI
100

200

200

150x200

System requirements :

OS :	Microsoft Windows 7 (64 bit) or greater
Processor :	Intel® Core™ i5 process or Intel® Core™ i7 processor or Intel® Xeon® Processor E3 Family
Memory :	16 GB minimum
Disk Space :	10 GB minimum free hard disk space
Video Card :	2 GB Microsoft OpenGL or Direct3D capable (*SolidWorks Certified cards and drivers recommended)