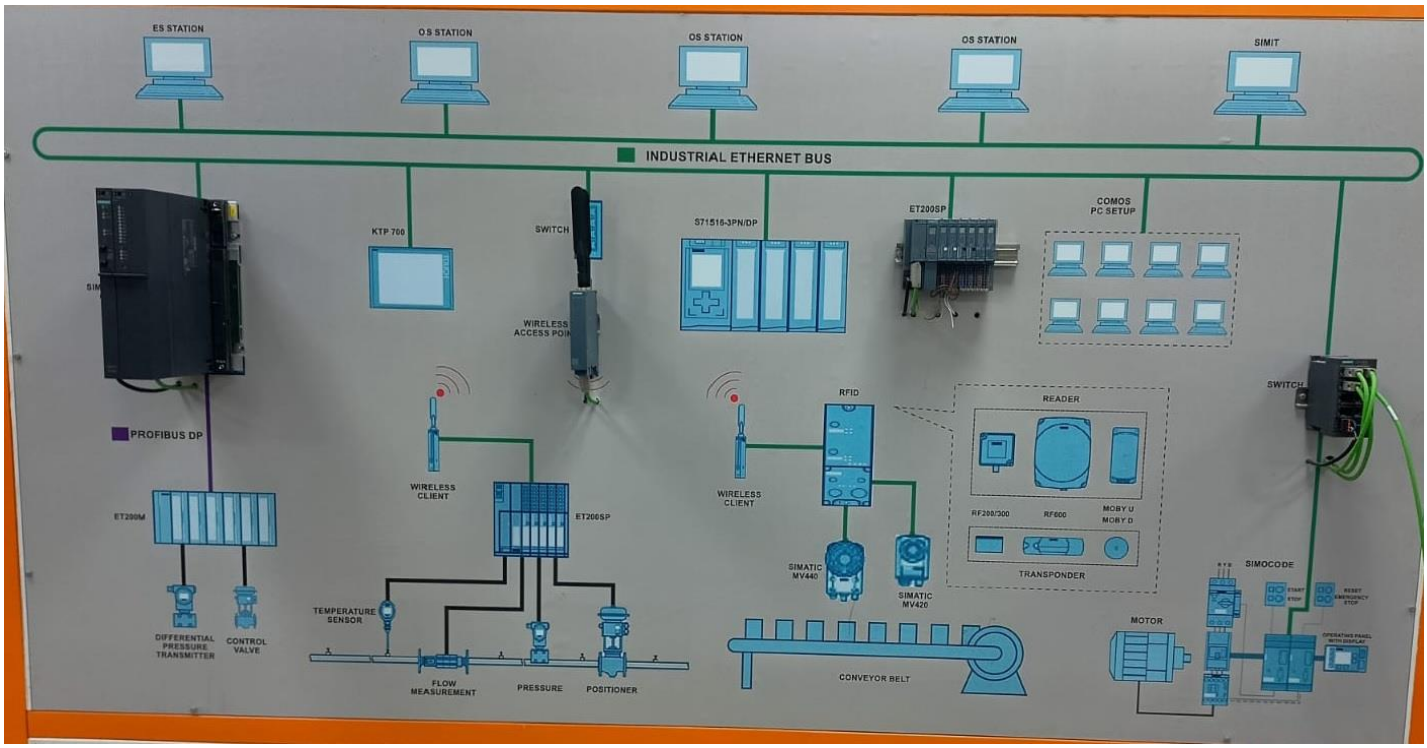
AVIT
AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY

VINAYAKA MISSION'S RESEARCH FOUNDATION
(Deemed to be University under section 3 of the UGC Act 1956)

DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING

NAME OF THE RESEARCH CENTER :

SIEMENS DCS COMOS INTEGRATED ENGINEERING



PREPARED BY:

Mr. S.PRAKASH, M.E

Assistant Professor (Gr -II)

EDITED BY:

Dr.L.CHITRA

Professor & HOD

PREFACE

This Research center manual for Siemens DCS COMOS Integrated Engineering has been revised and updated in order to meet the Curriculum changes, laboratory equipment upgrading and the latest simulation.

Every effort has been made to correct all the known errors, but nobody is perfect, if you find any additional errors or anything else you think is an error, Please feel free to inform the HOD / EEE at eeedept@avit.ac.in

The Authors thanked all the staff members from the department for their valuable Suggestions and contributions.

The Authors
Department of EEE

COMOS WORKING PROCEDURE

DESCRIPTION ABOUT COMOS:

With its unified data platform the integrated software solution COMOS provides plant design engineers, plant operating personnel, company management, and solution partners with a continuous flow of data that meet their specific needs across all project phase.

One requirement foe effective plant management is optimum networking and coordination of all disciplines and departments involved in the engineering and operation of a plant. The software solution COMOS is the basis for the cooperation of worldwide collaboration across the entire lifecycle of a plant.

The integrated COMOS software concept is based on object orientation. Components are described holistically and displayed graphically in their true-to-life representation. The graphical and data-related description. Which includes all data associated with the component. forms a single unit within the database - the object. Related data sheets, lists, and other documents are linked to the corresponding objects.

The complete plant information is stored in a central database. As a result COMOS allows all disciplines and departments involved in the engineering operating phases to always across the same data for a given object. Objects can be processed in COMOS bidirectional on data sheets as well as technical drawings.

The open system architecture of COMOS can be adapted to exactly meet company-specific requirements, allow links to third-party systems and can be integrated in to existing EDP (Electronic Data Processing) landscape.

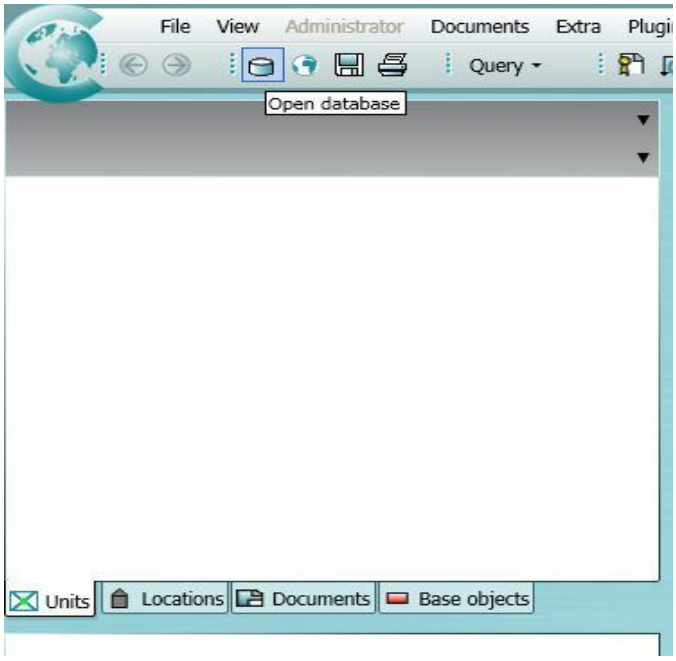
COMOS CONSIST OF:

- Object-oriented data management (Component Object Server)
- Working layer technology
- Generating data sheets
- User administration
- Export and import of data
- Export of COMOS data sheets to world document.
- Can be integrated with other Siemens product like PCS 7 and SIMIT.

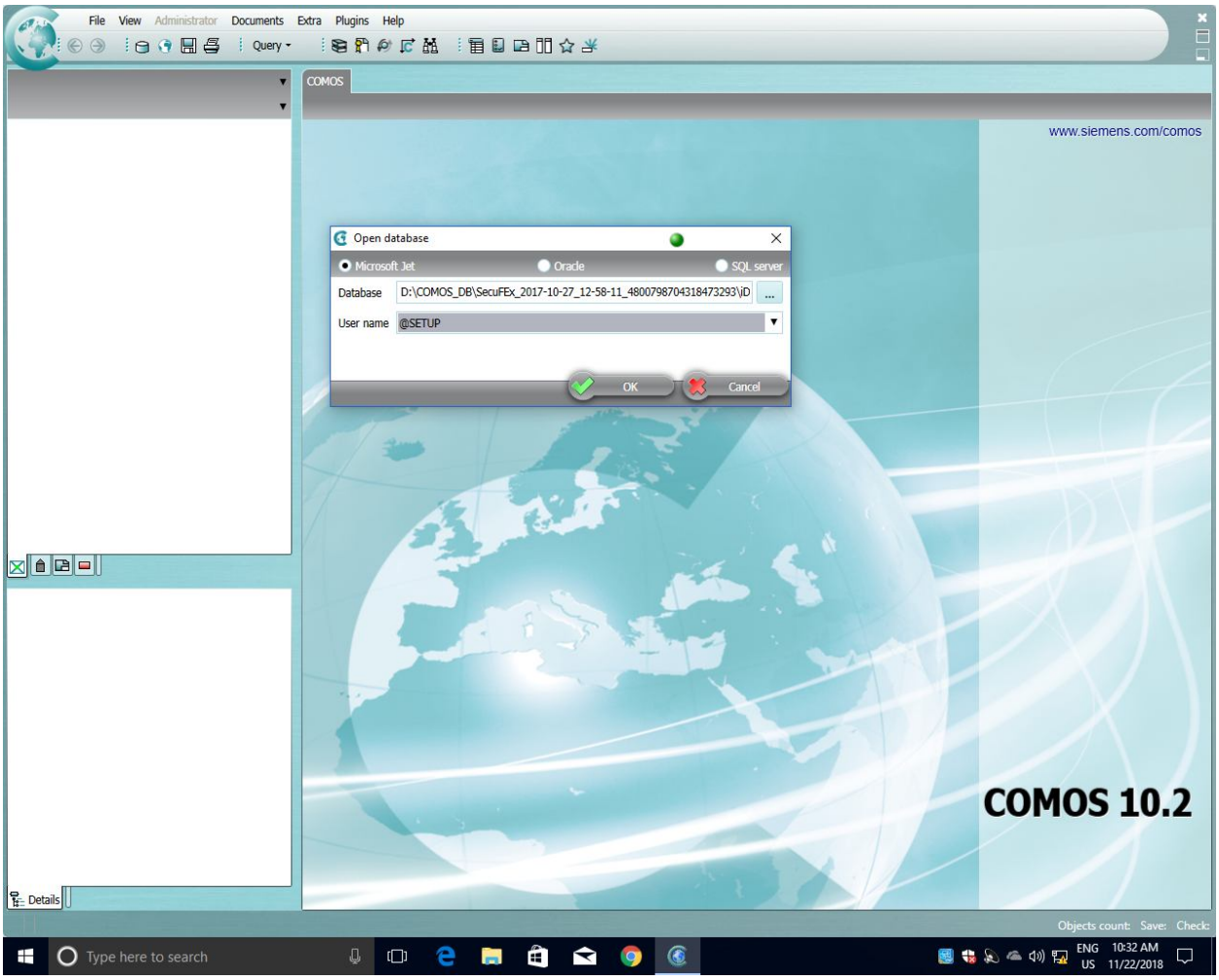
COMOS Working Procedure

STEP 1 : Open the COMOS licensed software 10.2 and the open window would be like shown in below.

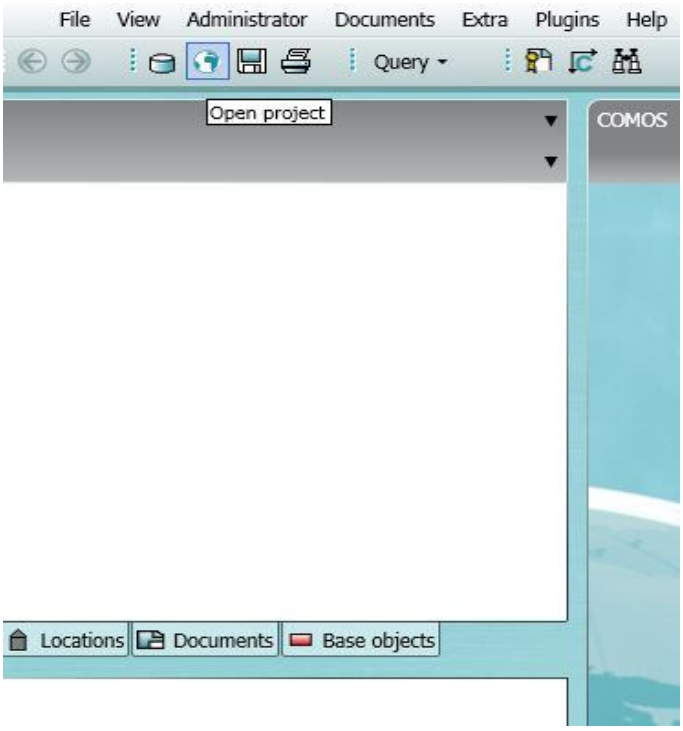
STEP 2 : After open the COMOS the working window will be open in the working window there will be a OPEN DATABASE icon just click it.



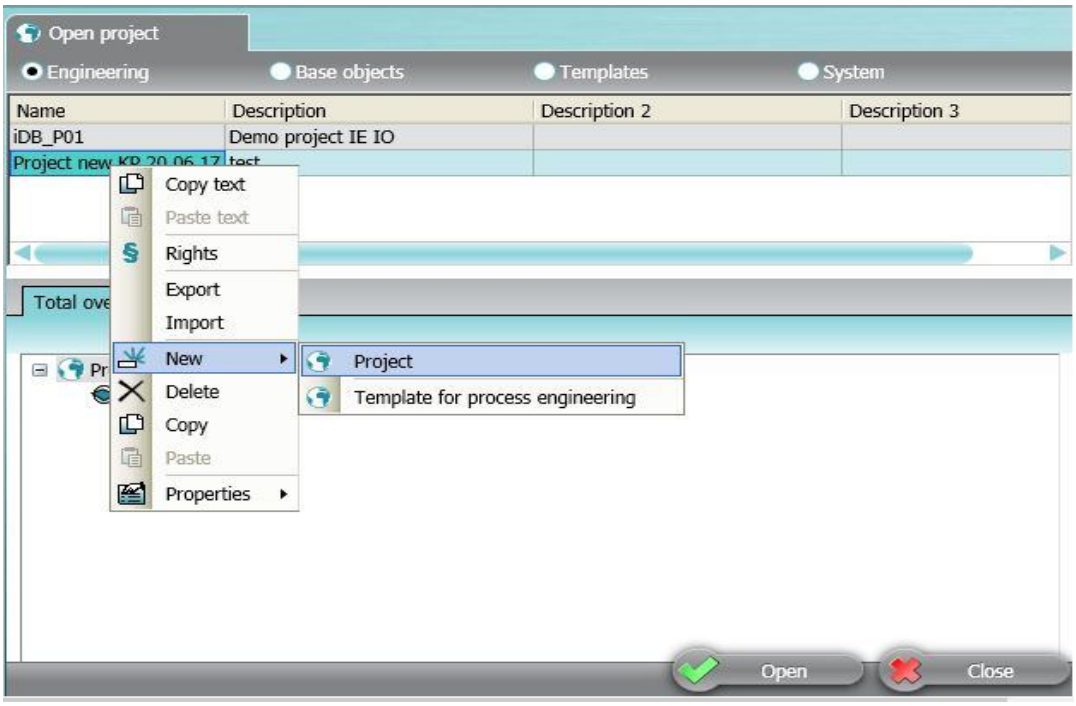
STEP 3: After clicking the open database a new user window will be open in that give OK.



STEP 4: Now go the menu bar there you can see the OPEN PROJECT and click that.

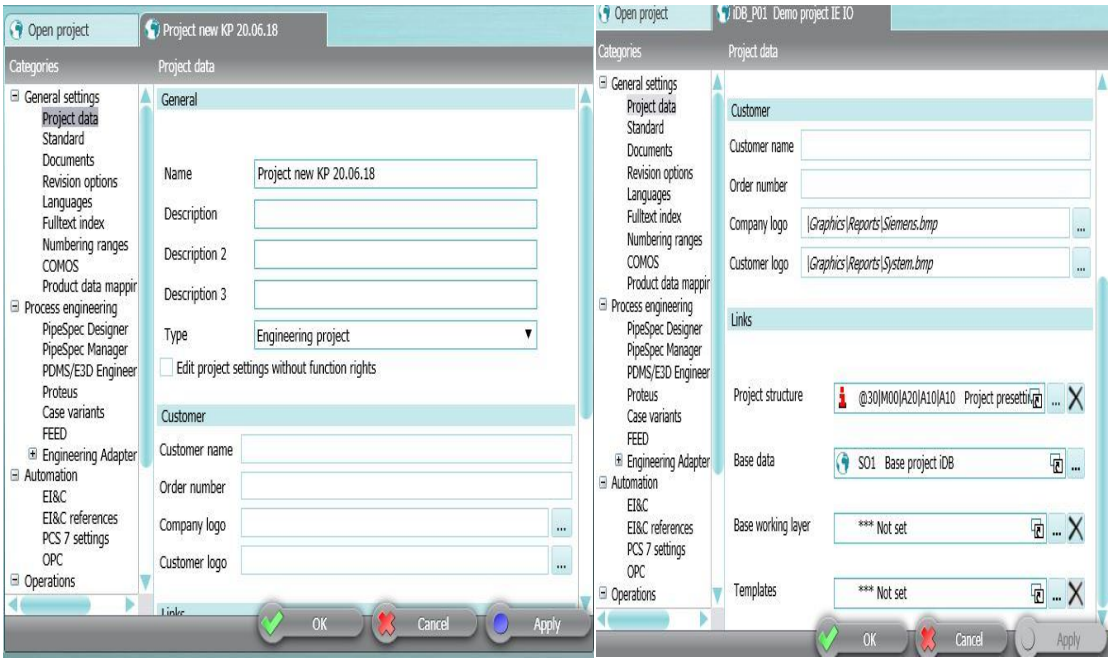


STEP 5 : After click the open project the new window will be open as shown in below.

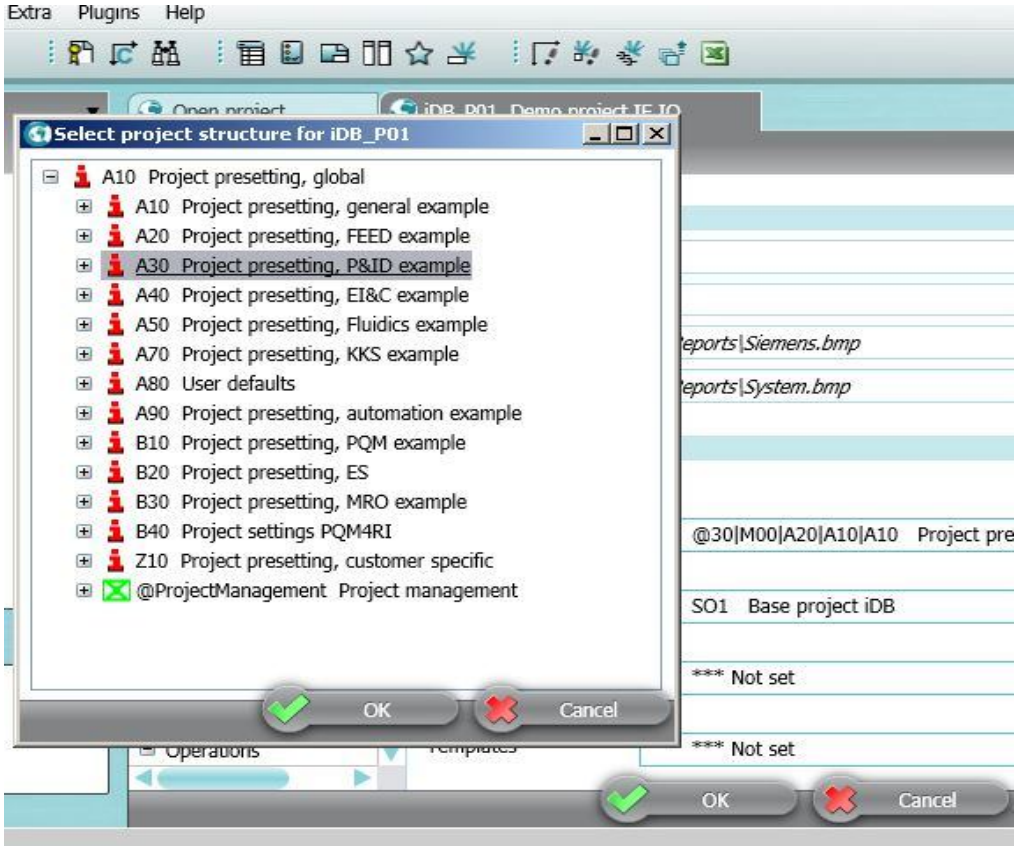


- From shown in above image right click → NEW → PROJECT

- The project will be created and go to the property of the project you can give the name for the project and select the structure of the project in the project structure bar. as shown in below.

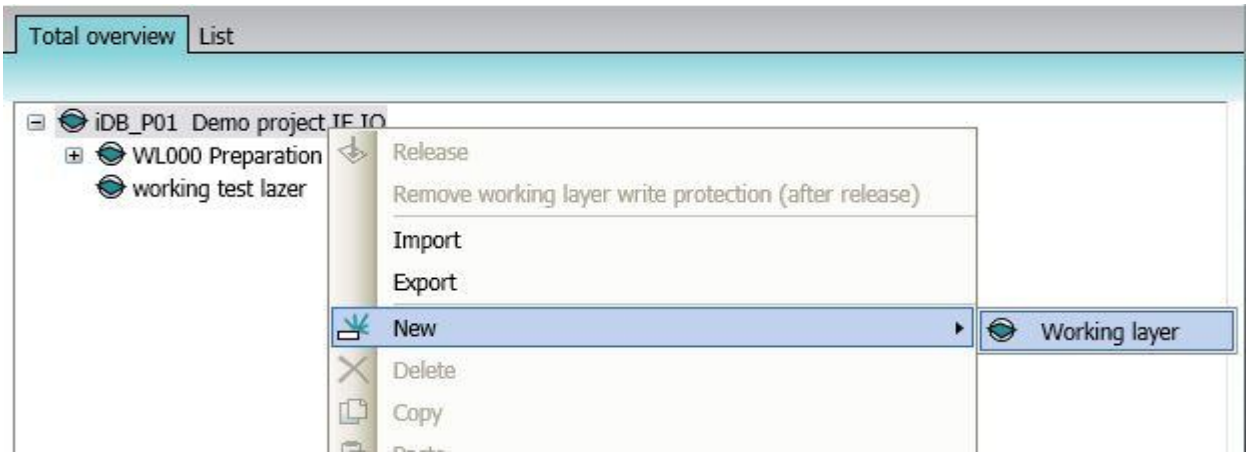


STEP 6: Now select the project structure with respect to the need we can select the project structure from the listed structures as show in below

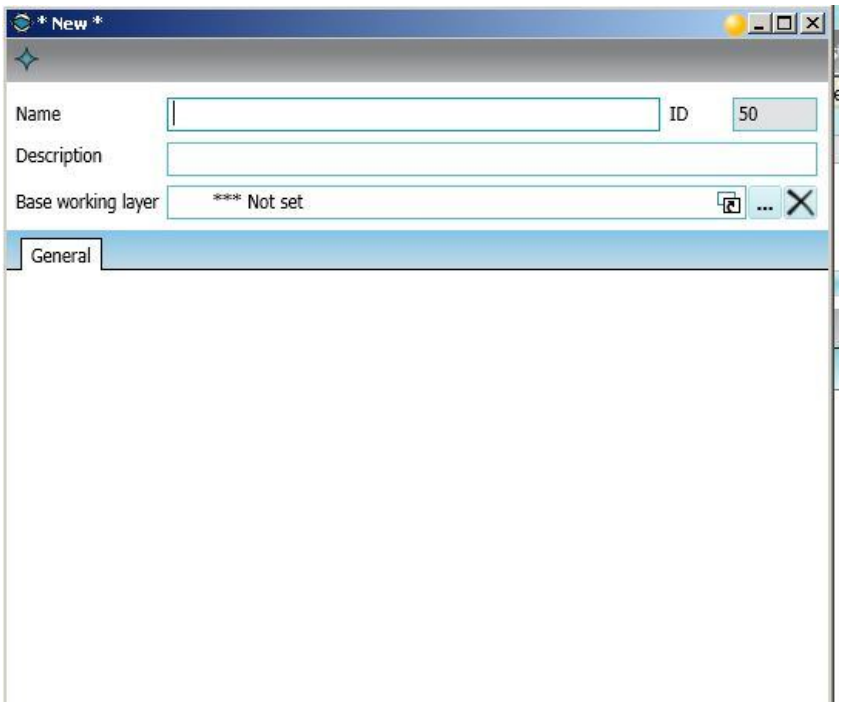


- Once you select the project structure the structure for the current project will be created and you can give OK.

STEP 7: After selected the project structure we have to create the working layer for doing our project. For create the working layer see the below image.



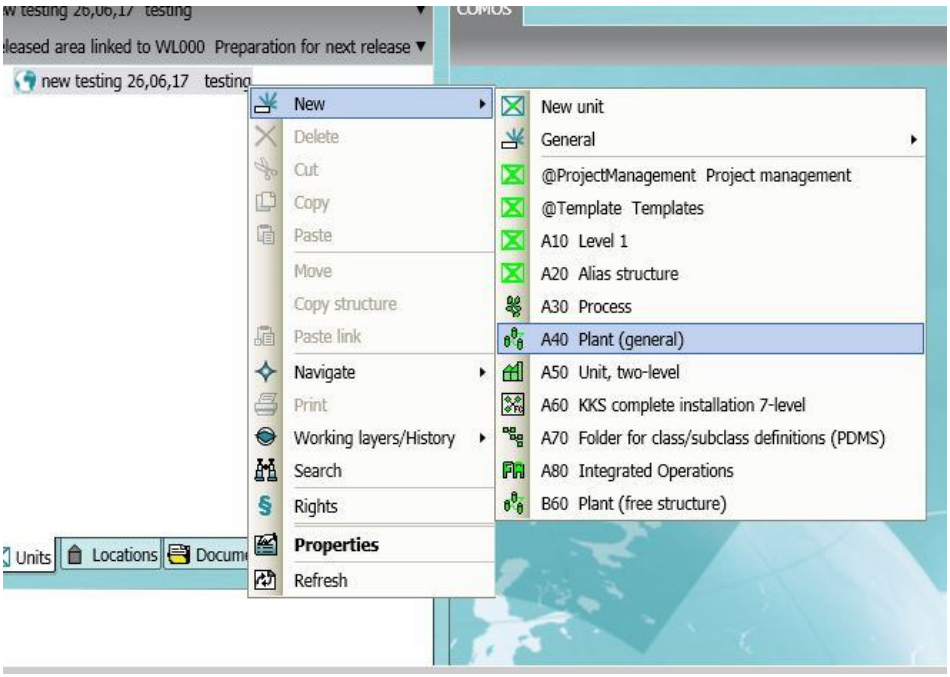
The new window will be open in that you can give name for the working layer and give OK the working layer created. The below shown image you can create name for the working layer.



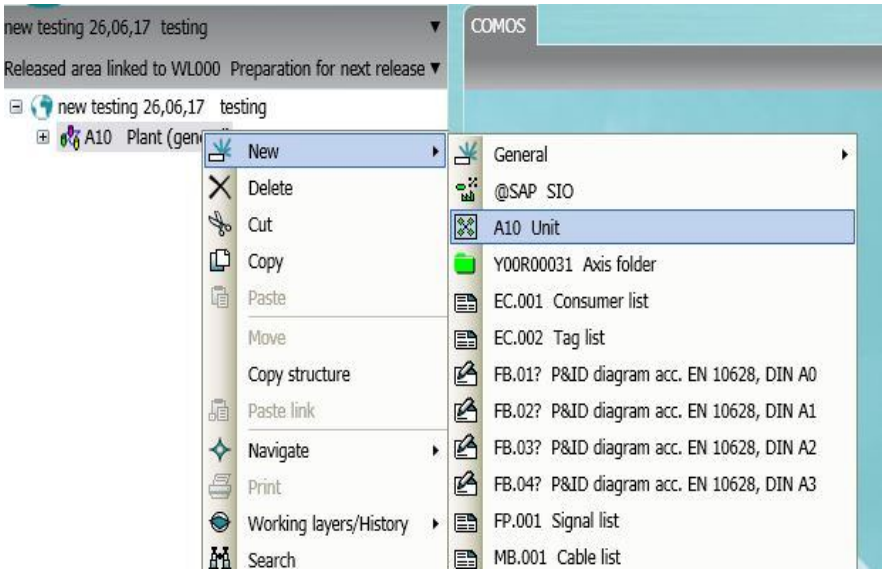
Purpose of Working Layer:

- They make distributed working in projects easier.
- They allow you to outsource project stated and parts projects to partners.
- They protect the tested data stock against unintentional or erroneous changes.
- They support seamless project histories.
- Identify changes/modifications before merging working layers

STEP 8: After create the working layer open the working layer and the layer will be appear in the navigator window.

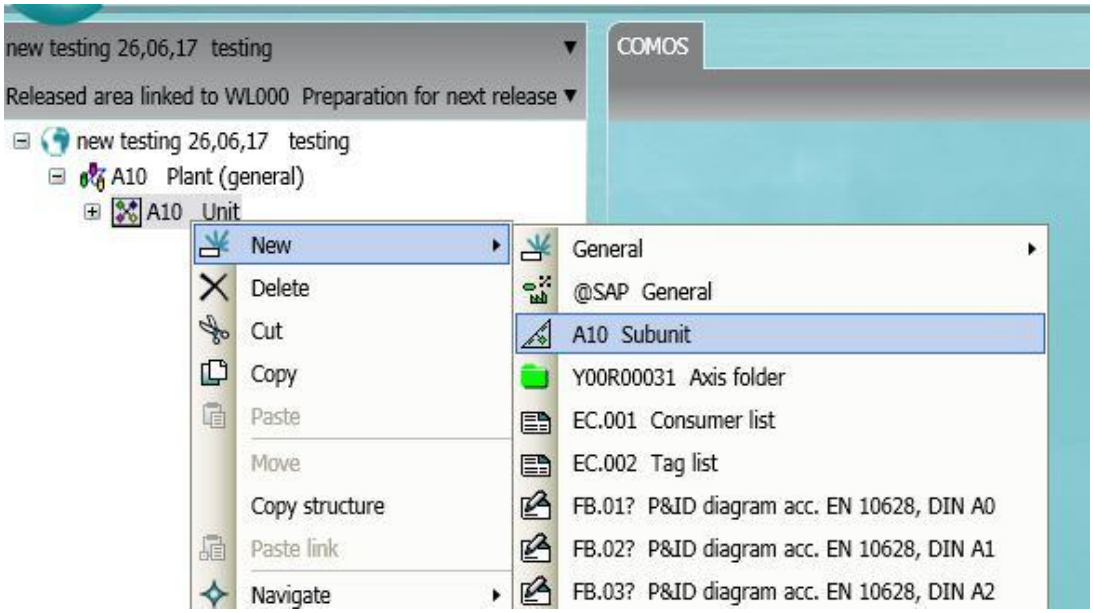


- By right clicking the working layer in navigator window you can create the structure for the project as shown in above image. The plant will be created as shown in below.

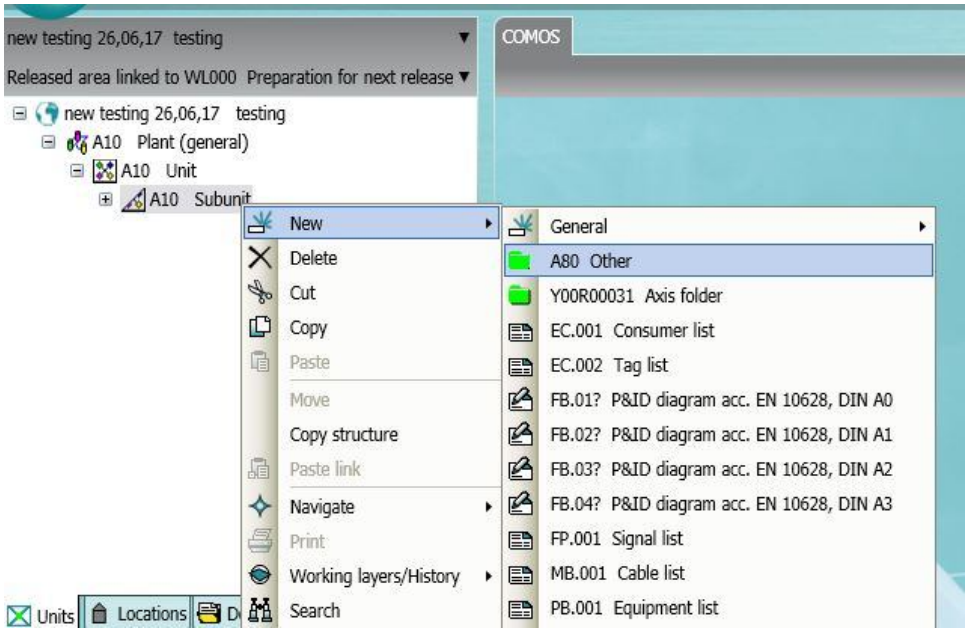


- After create the Plant we have to create the Unit below the plant by right clicking the A10 plant as shown in above.

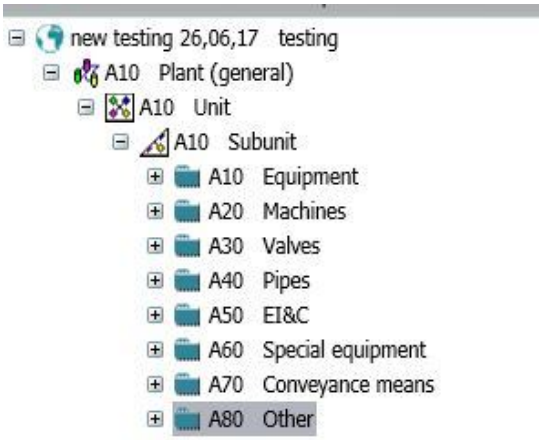
STEP 9 : After create the Unit under the Plant we have to create the Subunit below the unit by right clicking the A10 Unit. As shown in below.



- Now we have to create the structure of the subunit by right click the SUBUNIT as shown in below image.

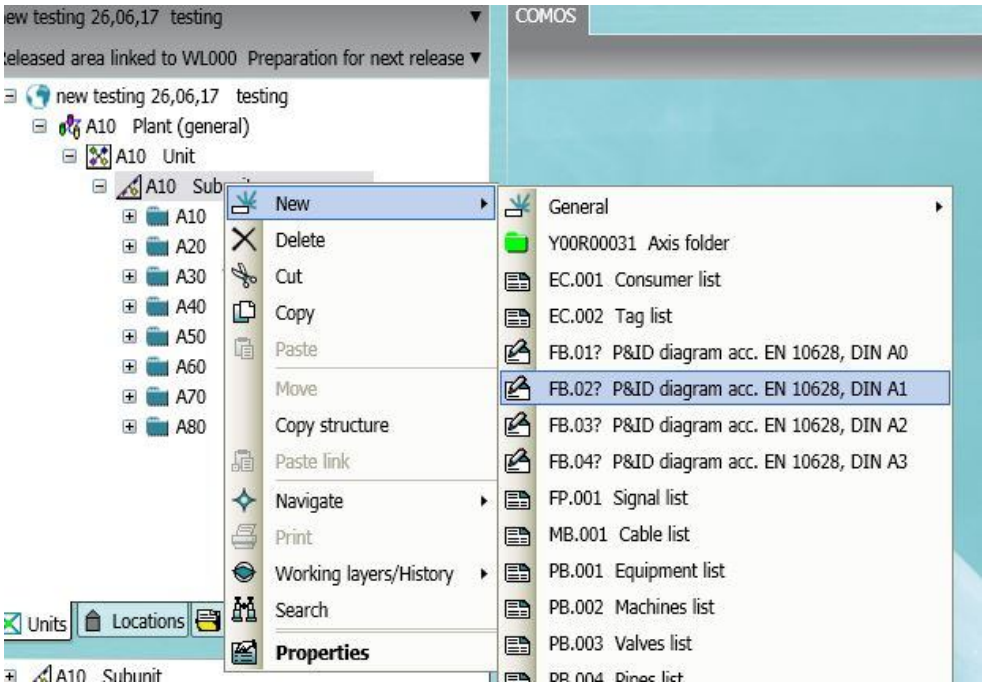


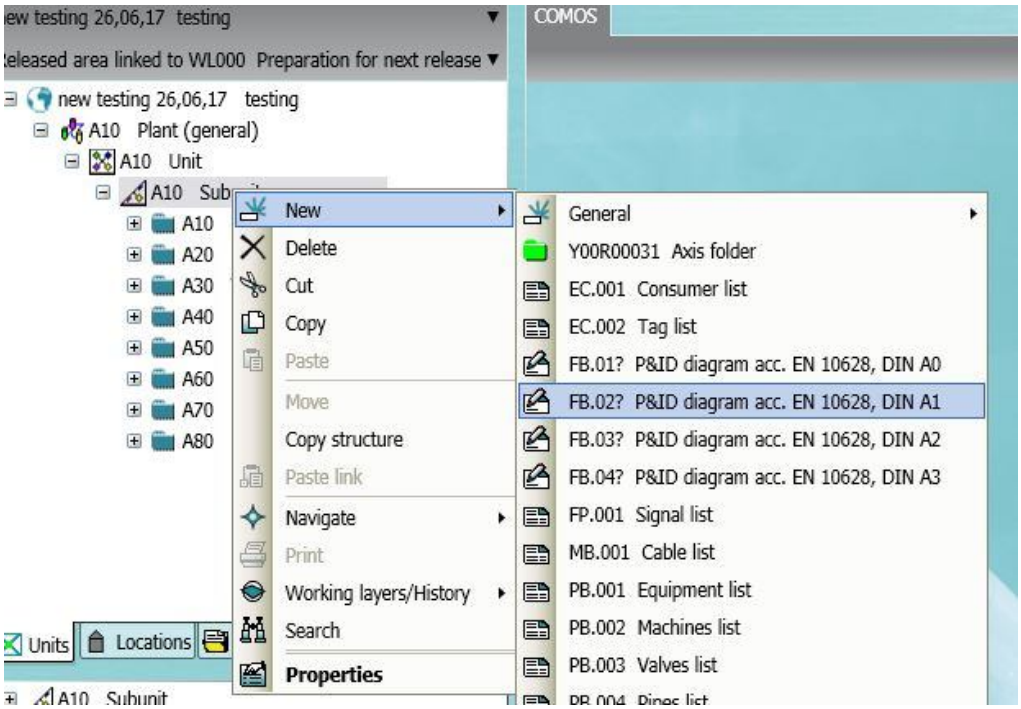
STEP 10 : Now the structure for our project was created and now we have to create the required components and equipments, valves and pipes for our project. The project structure would be like as shown in below.



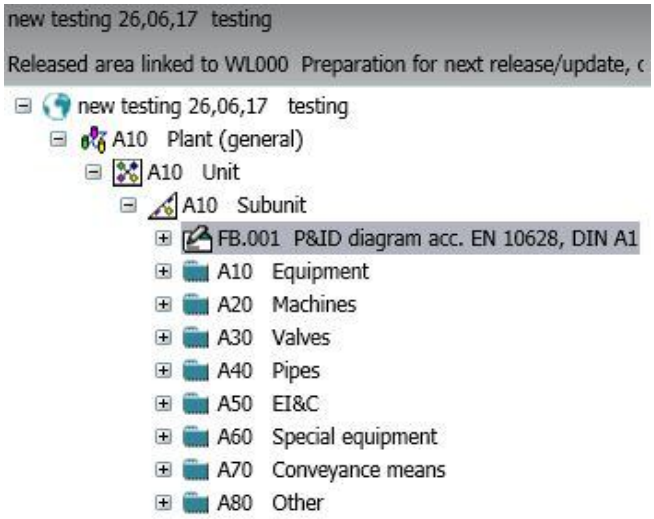
STEP 11: Now we have to create the Document P&ID for our project.

This is otherwise known as our working sheet. For create the working sheet or P&ID document Right click the SUBUNIT and select the any P&ID document as listed below the subunit. As shown in below.

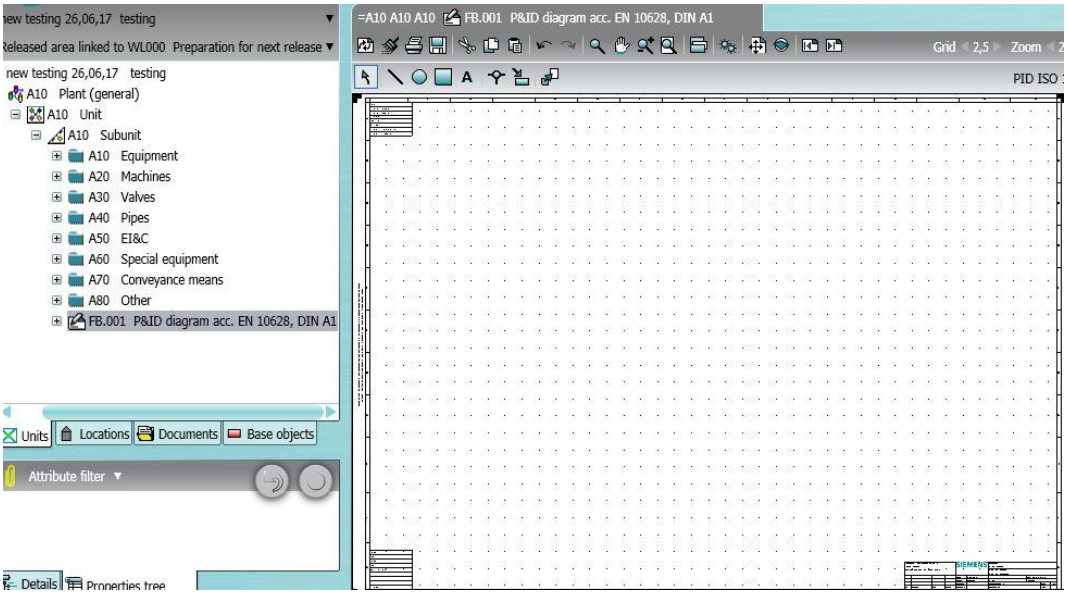




- The document will be created under the SUBUNIT as shown in below image.



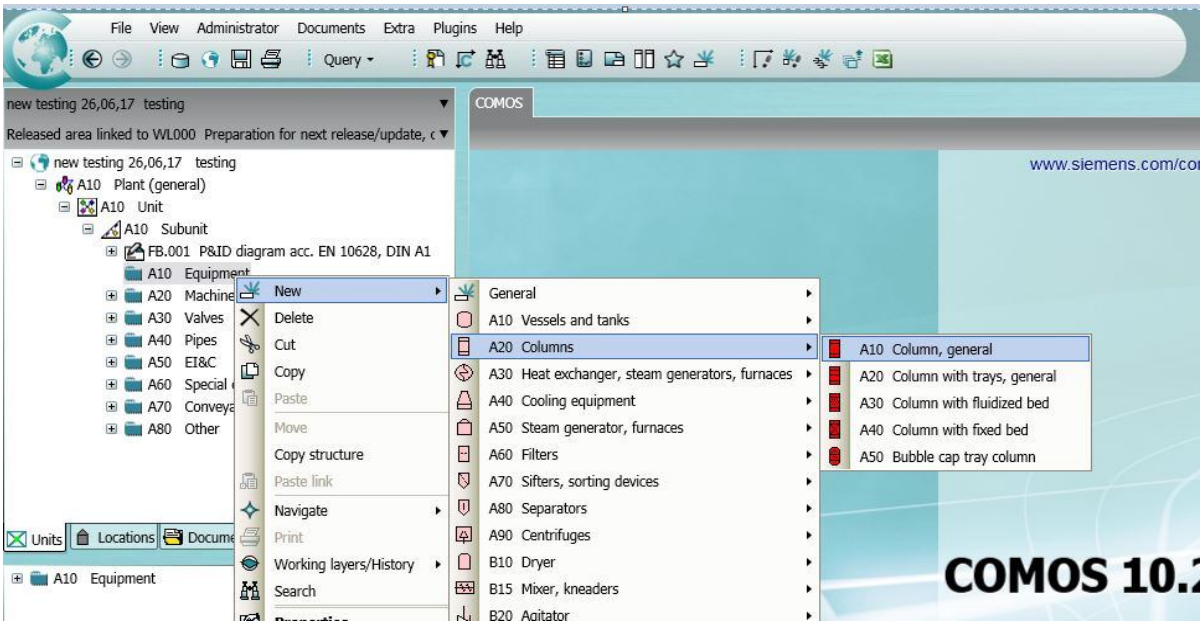
STEP 12: Now open the document by double clicking that and the working window would be open as shown in below image.

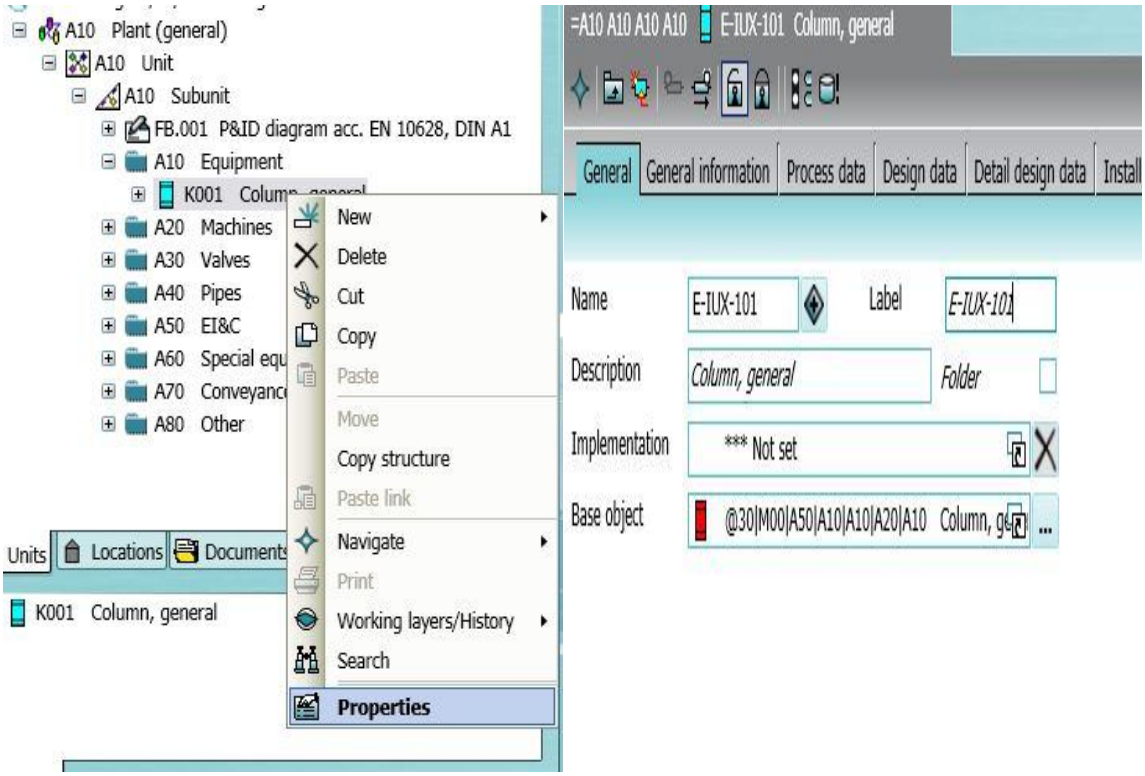


- In the working area we can create our P&ID and PFD and E&IC and all circuits diagram.
- All the Equipments, instruments, valves and pipes used in our projects are created under the respected folders in the listed project structure under the subunit.

Equipment Creation:

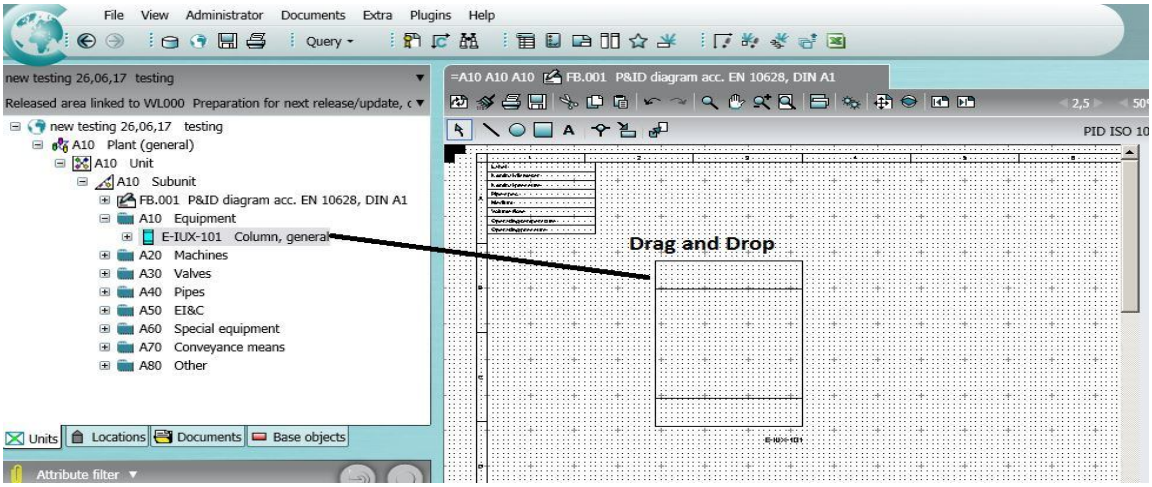
All the Required Equipments which are used in the plant are created in the A10 Equipment folder which consists of Vassal, Tanks, Pump, Motor, Column and other engineering equipments.



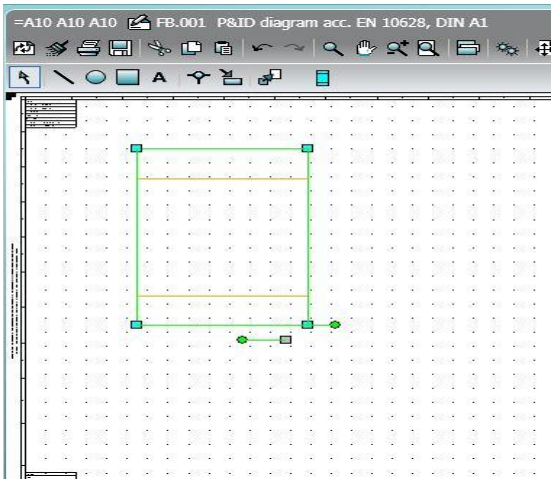


- After create the Equipment you can give name of the Equipment and verify other design data in the properties. AS shown in above.

The created equipment can be used in the working sheet by drag and drop that inside the working window as shown in below image.

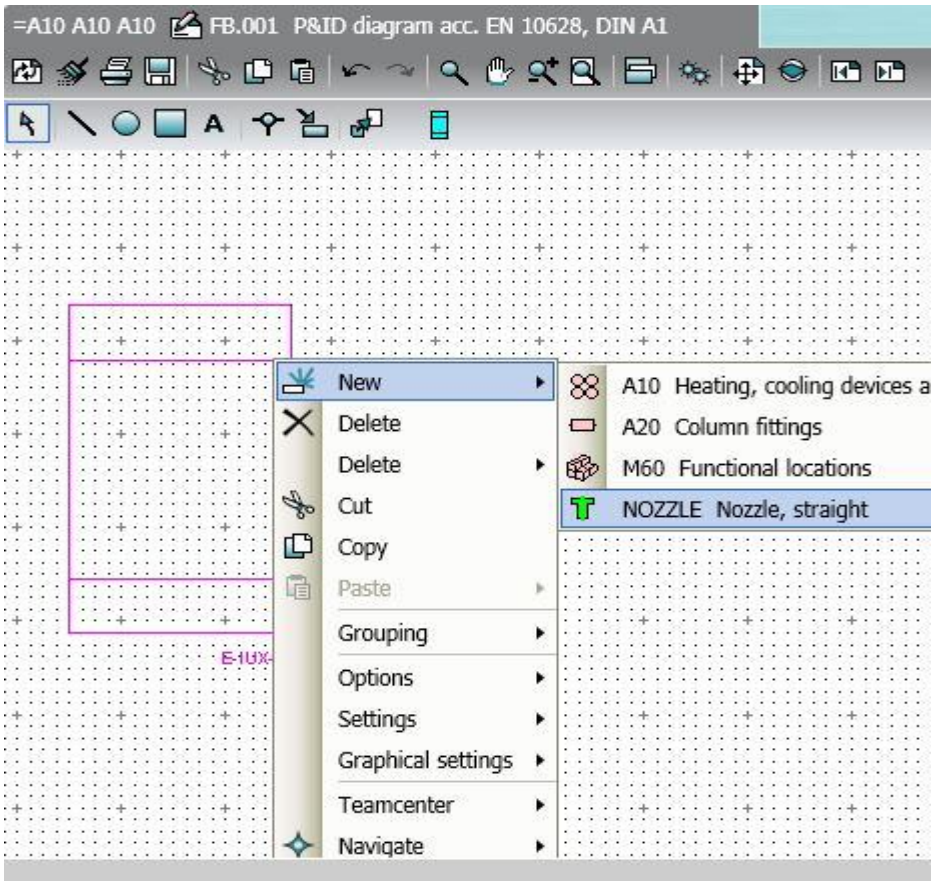


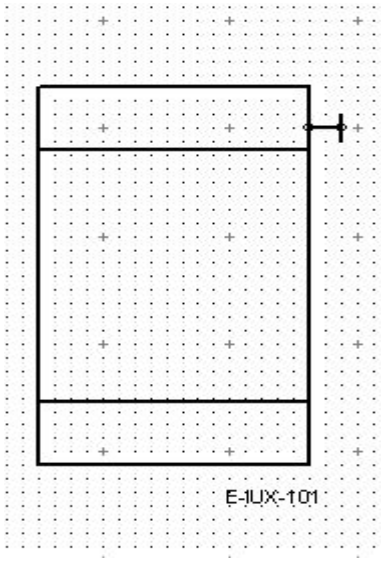
All the Equipments, Instruments, valves and special machines are can be used in the working area by drag and drop method.



Equipments can be enlarged with respect to our need. By double clicking the dragged equipments you can make that as large as shown in above image.

In the plant process every equipments should have the nozzles for the purpose of connecting pipings. For that we have to create the nozzle with the equipment by right clicking the equipment and give new and give nozzle as shown in below image.

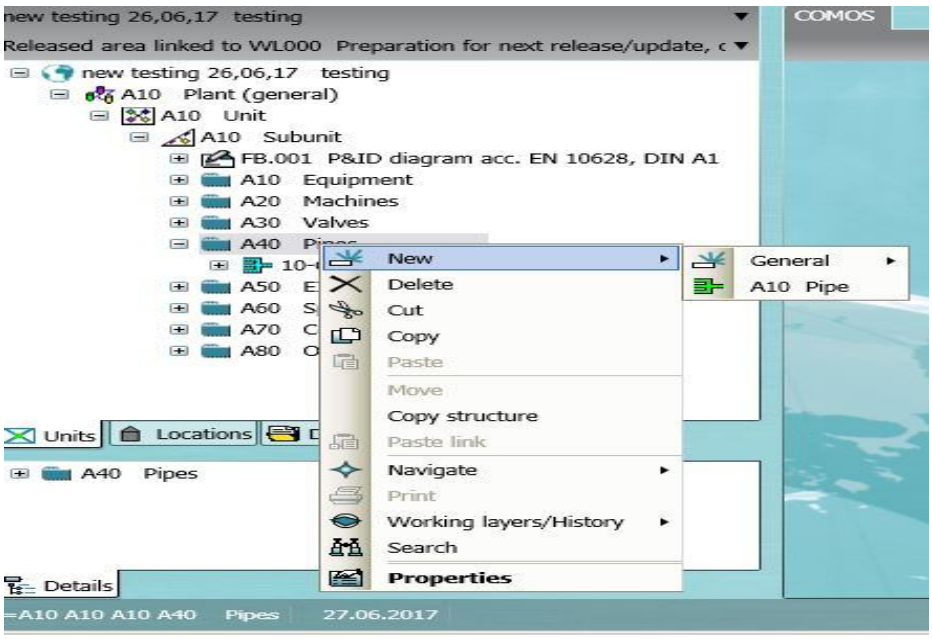




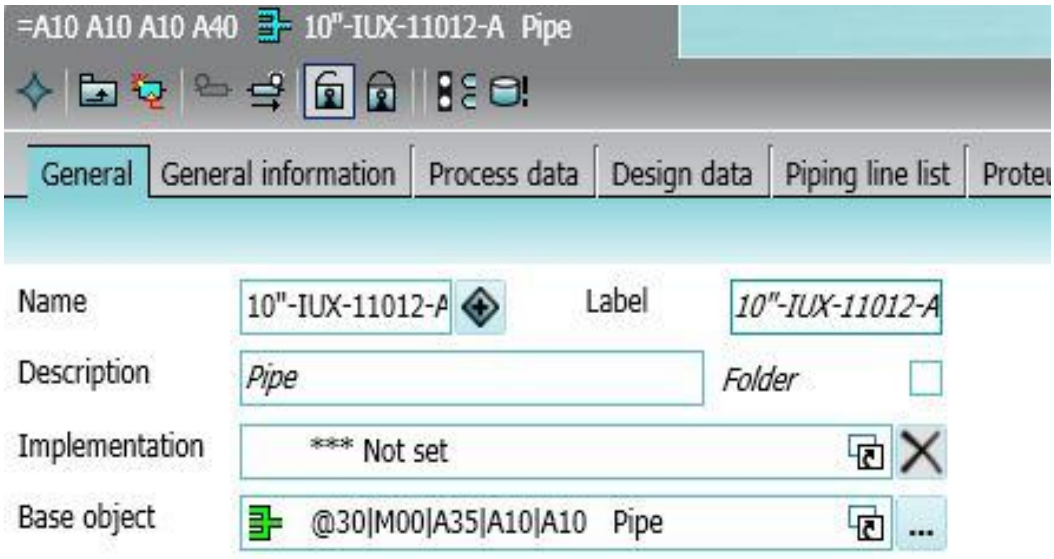
The above image shows the representation of the equipment after create the nozzle.

Pipeline creation:

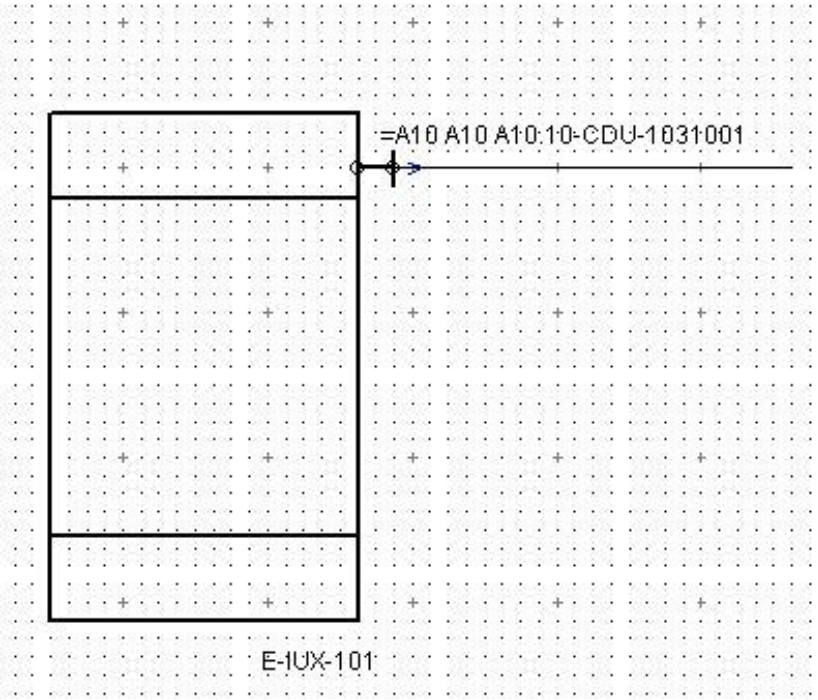
All the pipes which used in the P&ID's are created under the A40 pipes by right clicking the A40 pipes and go to new and give A10 pipe. As shown in below.



- In this case also you can give pipe tag number and name with respect to the need by right clicking the pipe and go the property and you can fill the required details. As shown below image.

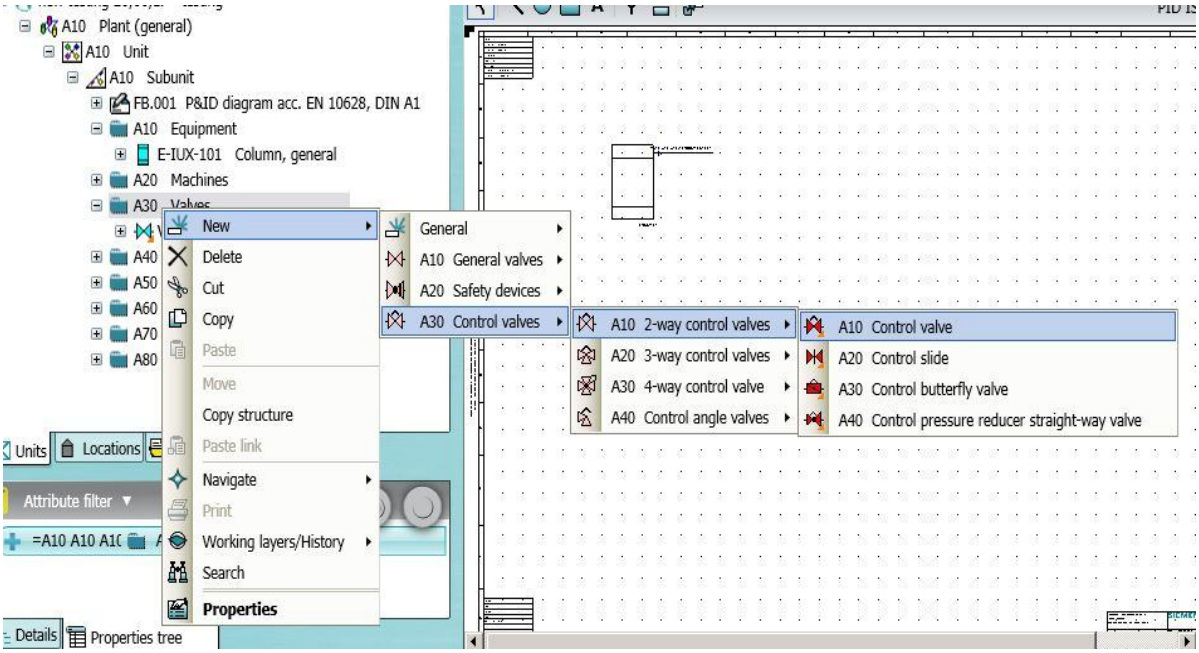


- The pipe lines are normally used to connect two equipments or instruments or two valves which involved in the plant Process or Piping Instrumentation Diagram.
- We can use the pipe line tag by picking the pipe tag and draw inside the working template or working sheet.

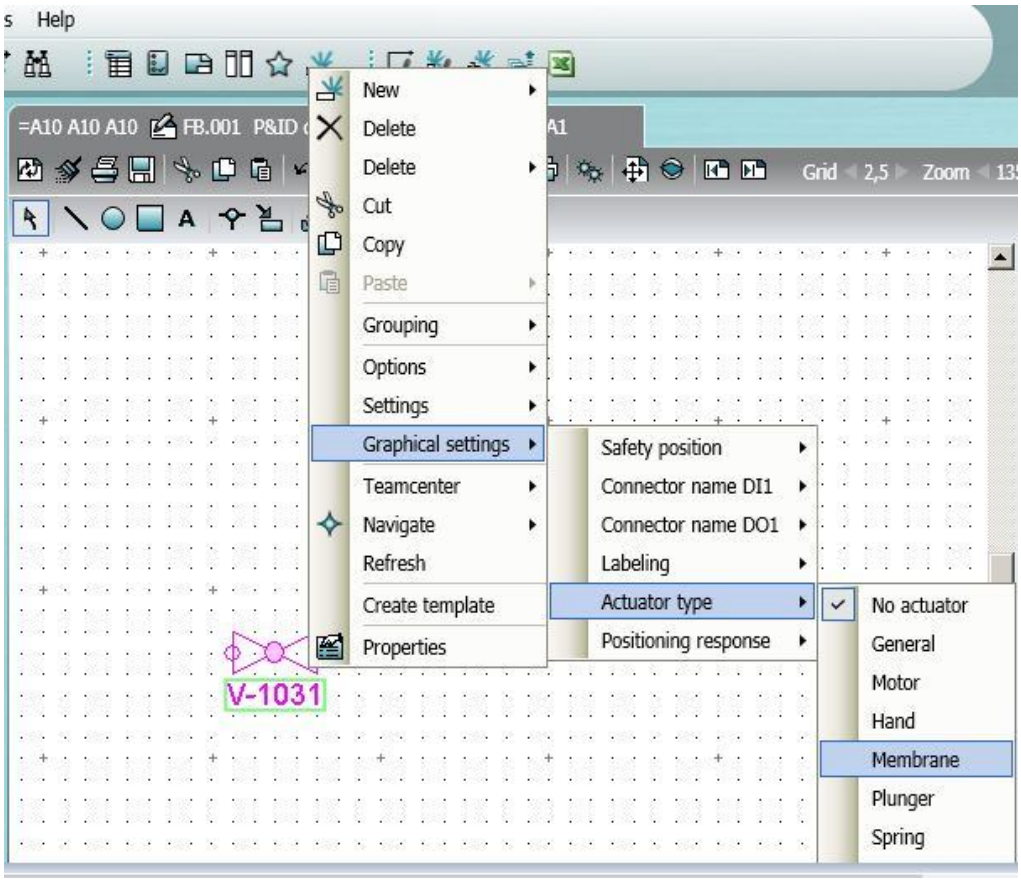


VALVE CREATION:

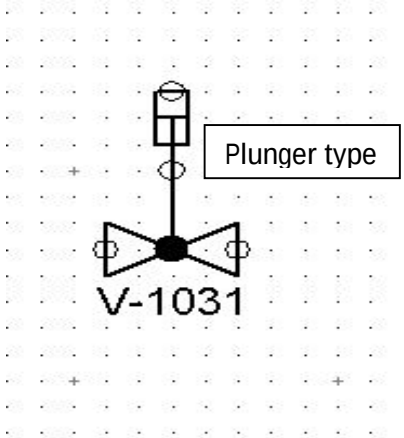
- Control valves are applied in the power industry for pressure and flow control of different liquids and gases.
- The wide variety of operating in which control valves can be used requires application of different designs: Gate valve, globe valve, ball valve and other Flow control valves are used.
- The most common type of end connection is a weld end for control valves and a flanged end connection for butterfly valves. Control is provided by means of changing the size of the orifice.
- All the valves which are used in COMOS can be created by navigation method (or) Right clicking the A30 valves in the project structure under the Subunit. AS shown in below.

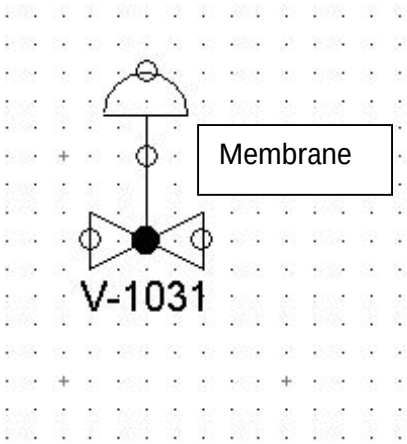


- From above image we can create all the required valves. After creates the valve we can drag drop it inside the working sheet (or) working window as shown in below.
- All the control valves need some actuation to control the flow. Here we can create the actuator for valve by right clicking the valve as shown in below image.
- Many type of actuators are there to control the valves for the flow control purpose. Normally flow control valves are actuated by manual or automatic actuators.
- For selecting the actuator right click the valve which for you need actuator and go to Graphical setting and go the Actuator type now you can select the required actuator as show in the image.



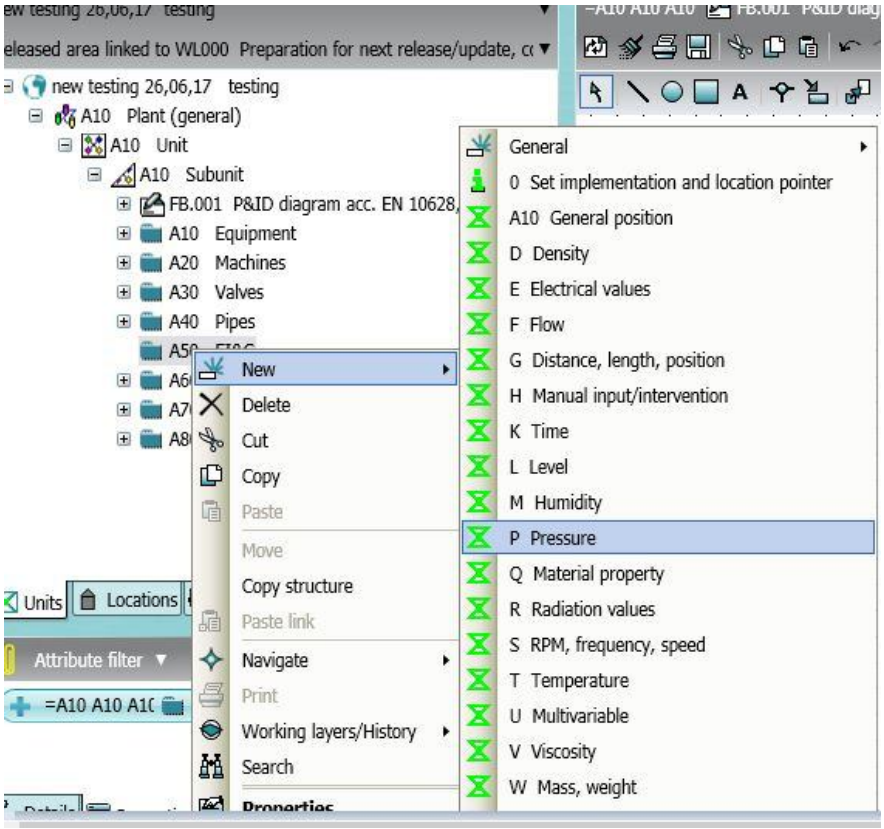
After select the actuator the valve would be like shown in below. This is the Plunger type actuator.



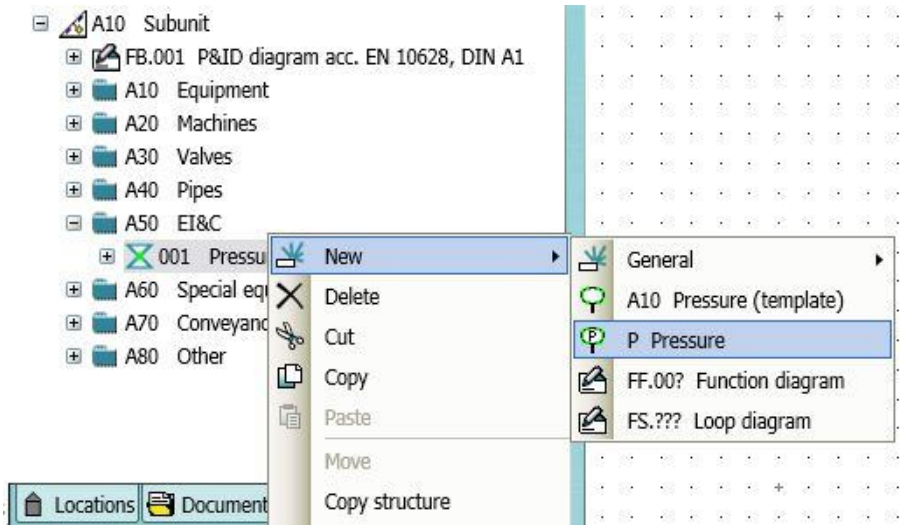


INSTRUMENTS CREATINONS:

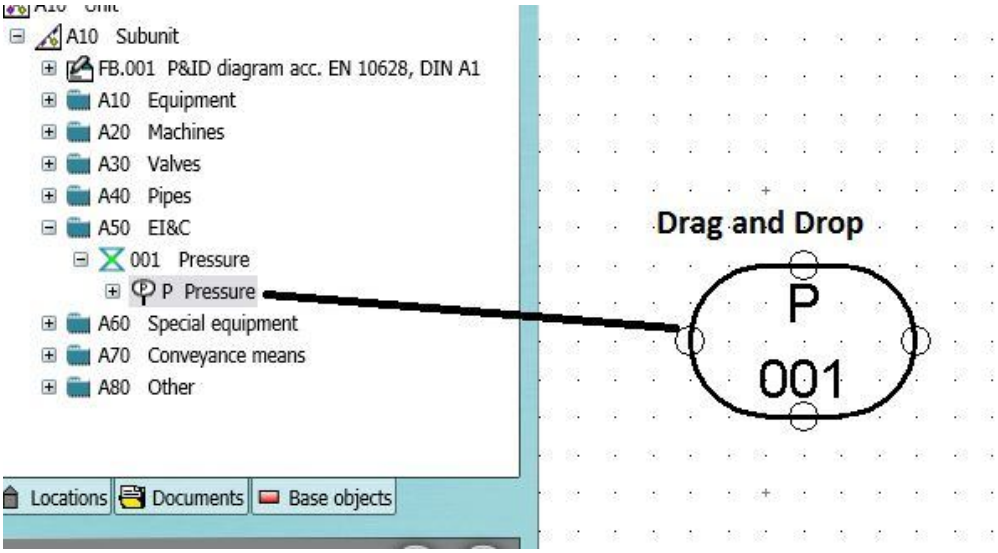
- Instrumentation and control is an integral part of power station. A modern, advanced I & C plays a major role in the profitable operation of plant by achieving maximum availability, reliability , flexibility, maintainability and efficiency. These systems can also assist in maintaining emissions.
- Normally various Transmitters and Indicators are used in the power plants and P&ID also representing as same as in COMOS.
- For control and monitoring the temperature we are using the Temperature Indicator and Temperature Transmitter and Temperature Element. All these are represents by TE , TT, TI .
- For control and monitoring the Flow we are using Flow Element, Flow Transmitter and Flow Indicator which are represented by FE,FT, FI.
- For control and monitoring the Pressure we are using Pressure Transmitter and Pressure Indicator.
- By right clicking the A50 E&IC we can create the required instruments as shown in below.



From shown above image we can create the require instruments. And again select the Pressure and go to new and give pressure as shown in below.

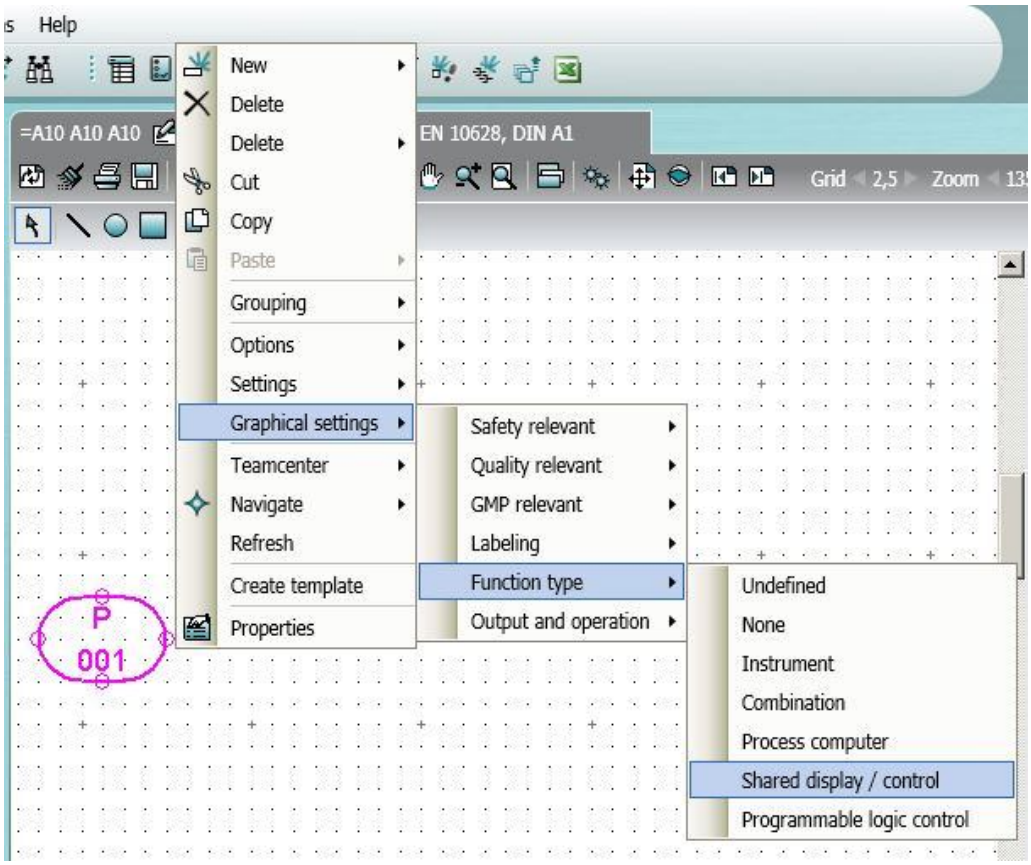


- The instrument will be created like below and we can drag this in to our working sheet. as shown in below.

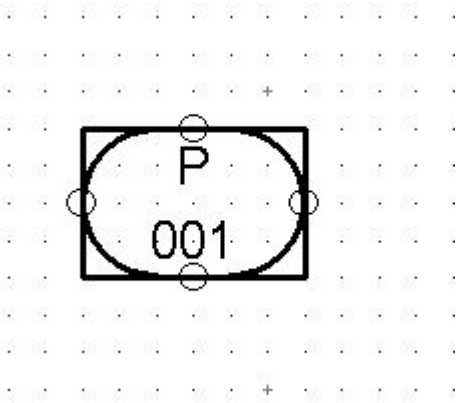


- After create the instruments we can change the graphical property of the instruments and other shapes.

Right click Instrument ⟶ Graphical Settings ⟶ Function Type ⟶ Shared Control/ Display

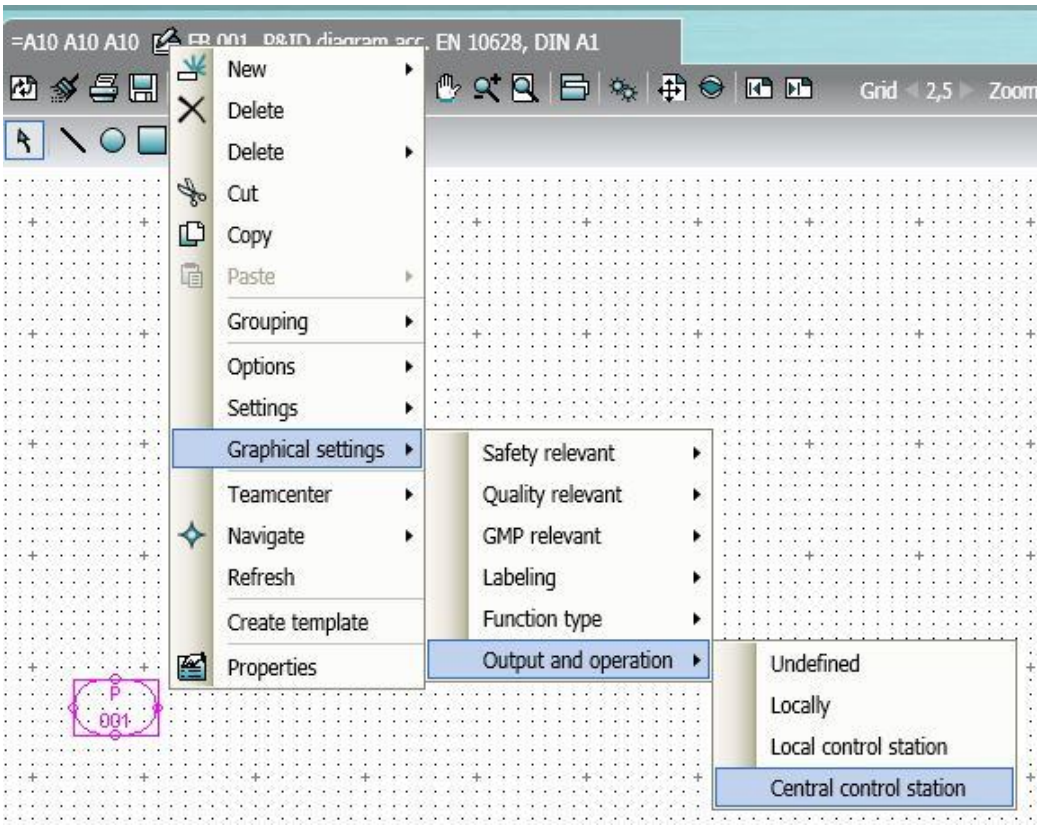


The Shared display / Control would be created as below image.

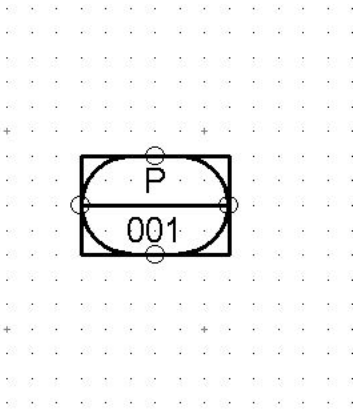


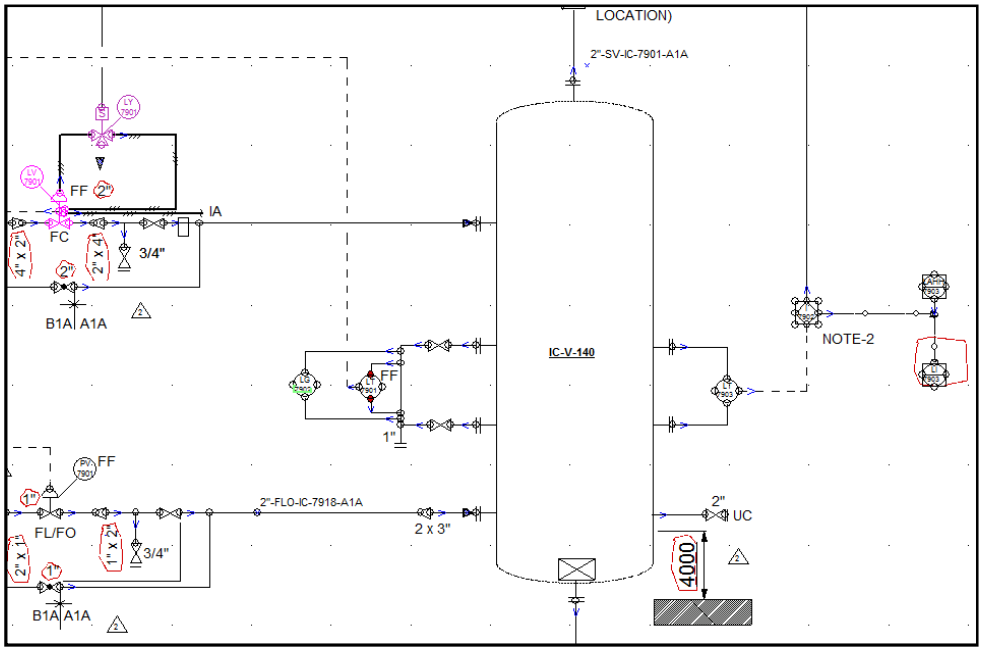
Also you can change the Output and operation of the instruments by right clicking the instrument.

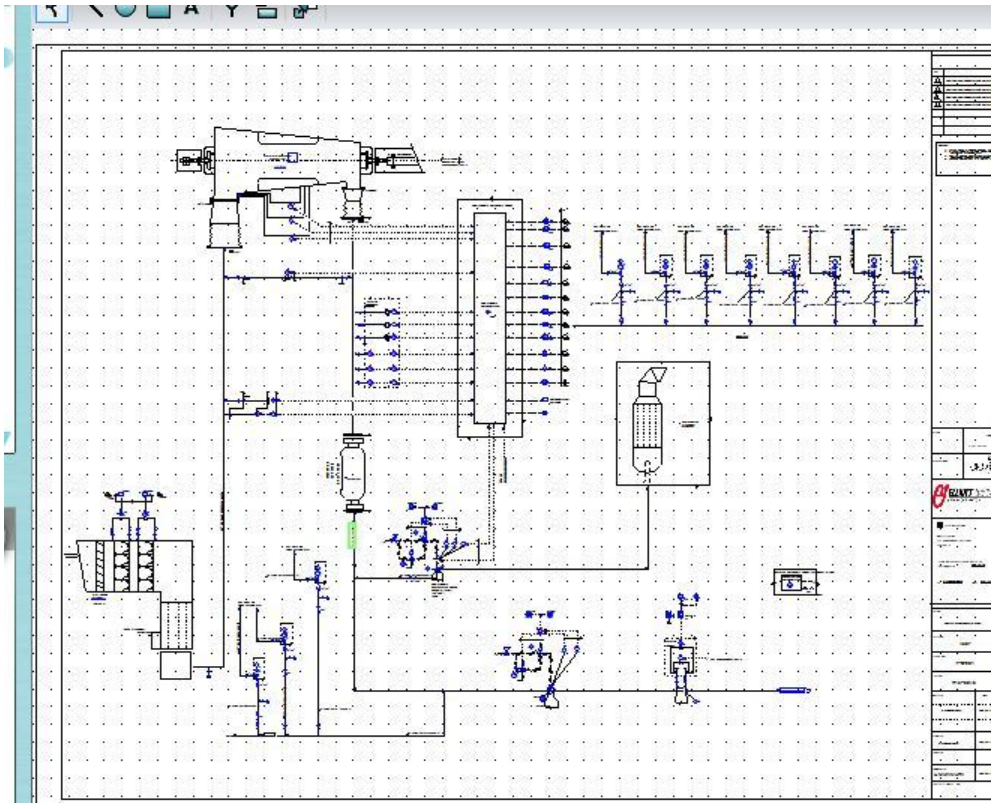
Right click Instrument ⟶ Graphical settings ⟶ Output and operation ⟶ Central control station



The below image is the representation of central control station of the pressure control device.







The P&ID diagram would be like above image. All the equipments and instruments which are used in this above Piping and Instrumentation Diagram are created by context menu.