NEO SUBSEA DESIGN

https://neosubseadesign.webador.fr

PIPING DESIGN

BASIC DESIGN CONCEPTS

PIPING DRAWINGS

PIPING DRAWINGS

The primary drawings that a Piping / Mechanical Field Engineer will use in the course of completing a field assignment are:

- PFD (Process Flow Diagram)
- Piping and Instrument Diagram (P&ID)
- Piping Isometric
- Plot Plans
- Piping Class Sheets
- Piping Support & Hanger Drawings (*Ref Topic #3)*
- Vendor Drawings and Manuals

PIPING DRAWINGS

- Instrument and Tubing Drawings
- Standard Instrument Details These drawings along with project installation specifications provide quality guidelines for properly completing the assigned system.

PIPING DRAWINGS

Process Flow Diagram

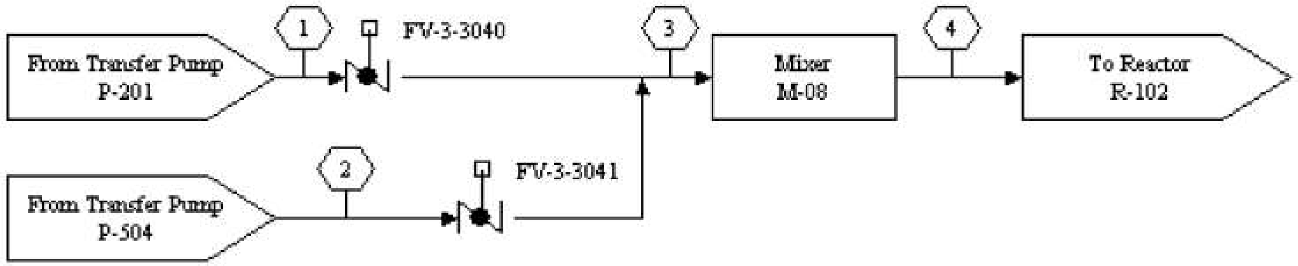
A Process Flow Diagram - PFD shows the relationships between the major components in the system. PFD also tabulate process design values for the components in different operating modes, typical minimum, normal and maximum. A PFD does not show minor components, piping systems, piping ratings and designations.

A PFD should include:

- Process Piping
- Major equipment symbols, names and identification numbers
- Control, valves and valves that affect operation of the system
- Interconnection with other systems
- Major bypass and recirculation lines
- System ratings and operational values as minimum, normal and maximum flow, temperature and pressure
- Composition of fluids

PIPING DRAWINGS

This figure depict a small and simplified PFD (Process Flow Diagram) :



Mode	Parameter	Points			
		1	2	3	4
Normal	Pressure MPa				
	Temp °C				
	Flow m^3/hr				
Maximum	Pressure MPa				
	Temp °C				
	Flow m^3/hr				
Minimum	Pressure MPa				
	Temp °C				
	Flow m^3/hr				

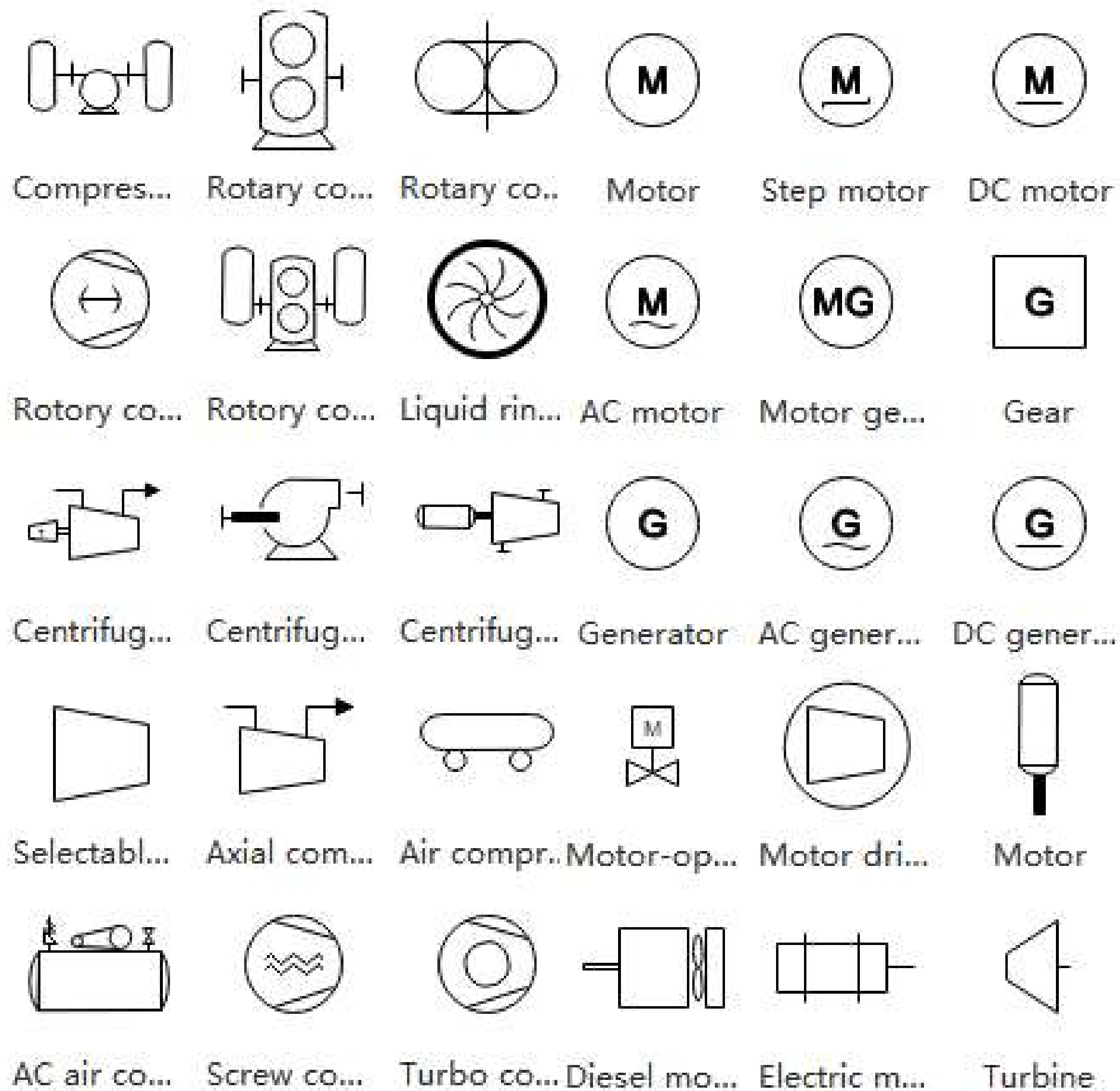
PIPING DRAWINGS

Conveys the major processing steps represented by the equipment

- Useful for conveying the heat and material balances
- Useful for conveying major pieces of equipment
- Useful for conveying processing conditions
- Useful for conveying utilities

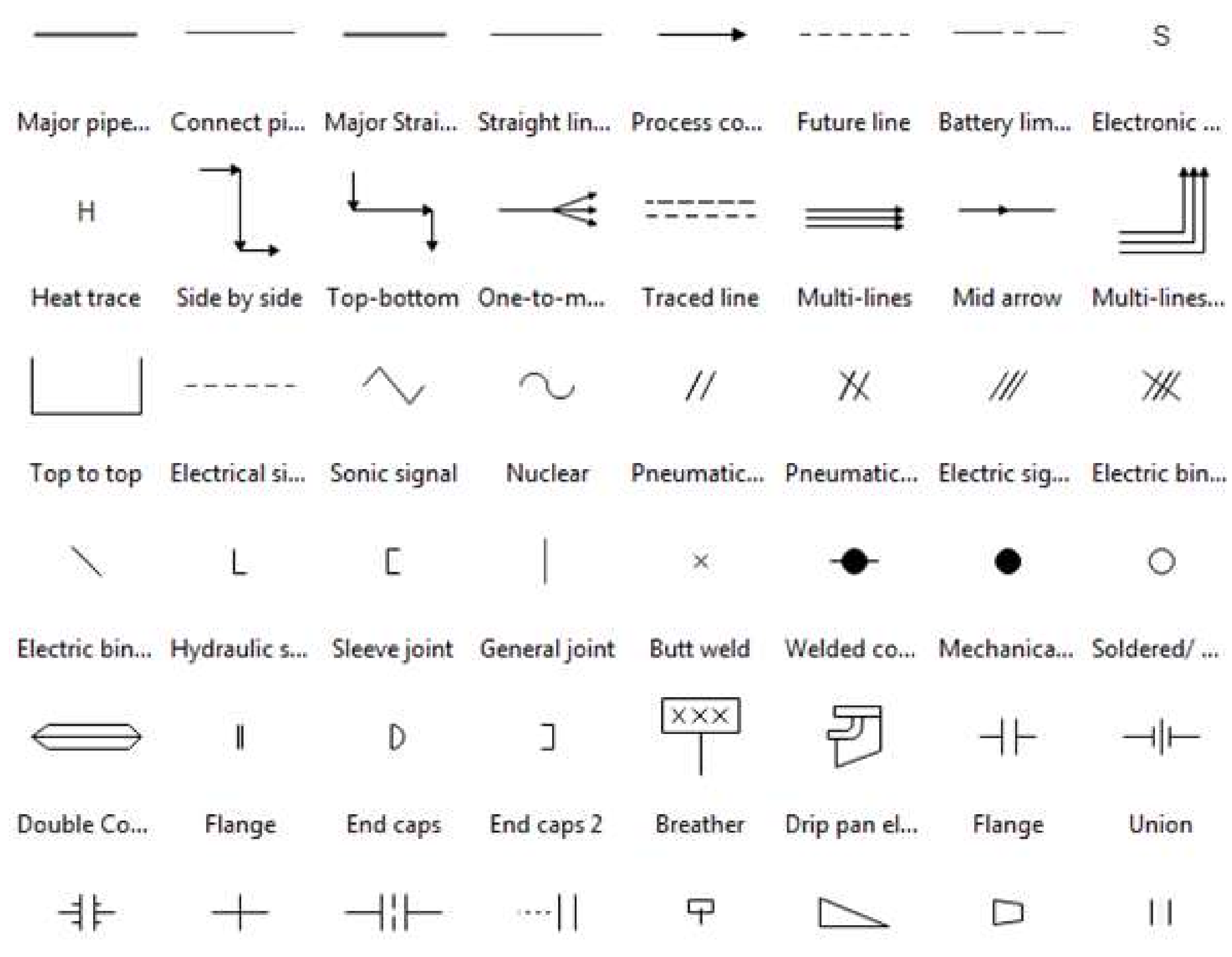
PIPING DRAWINGS

PFD symbols - Equipments



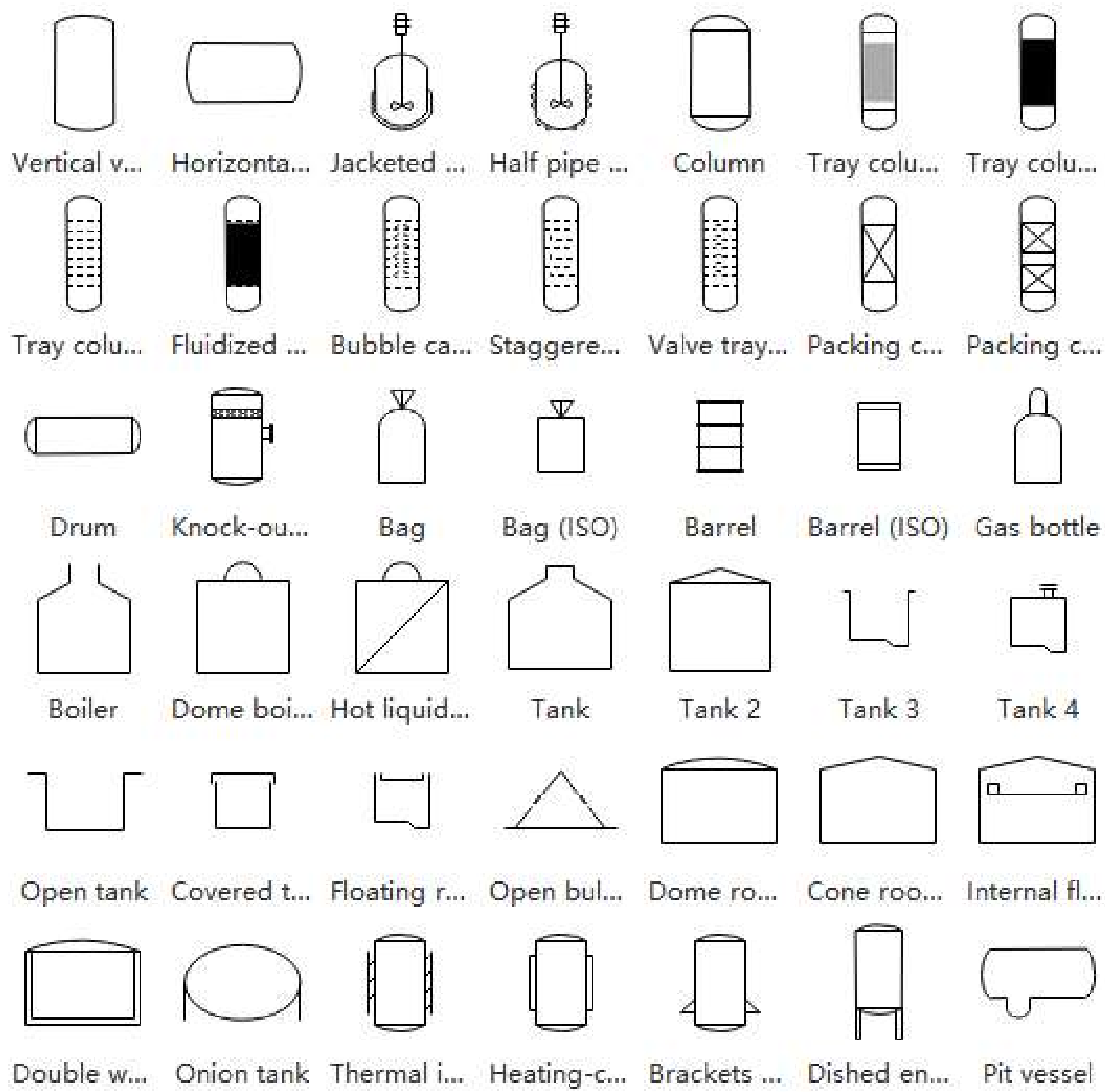
PIPING DRAWINGS

PFD symbols – Piping & Connection Forms



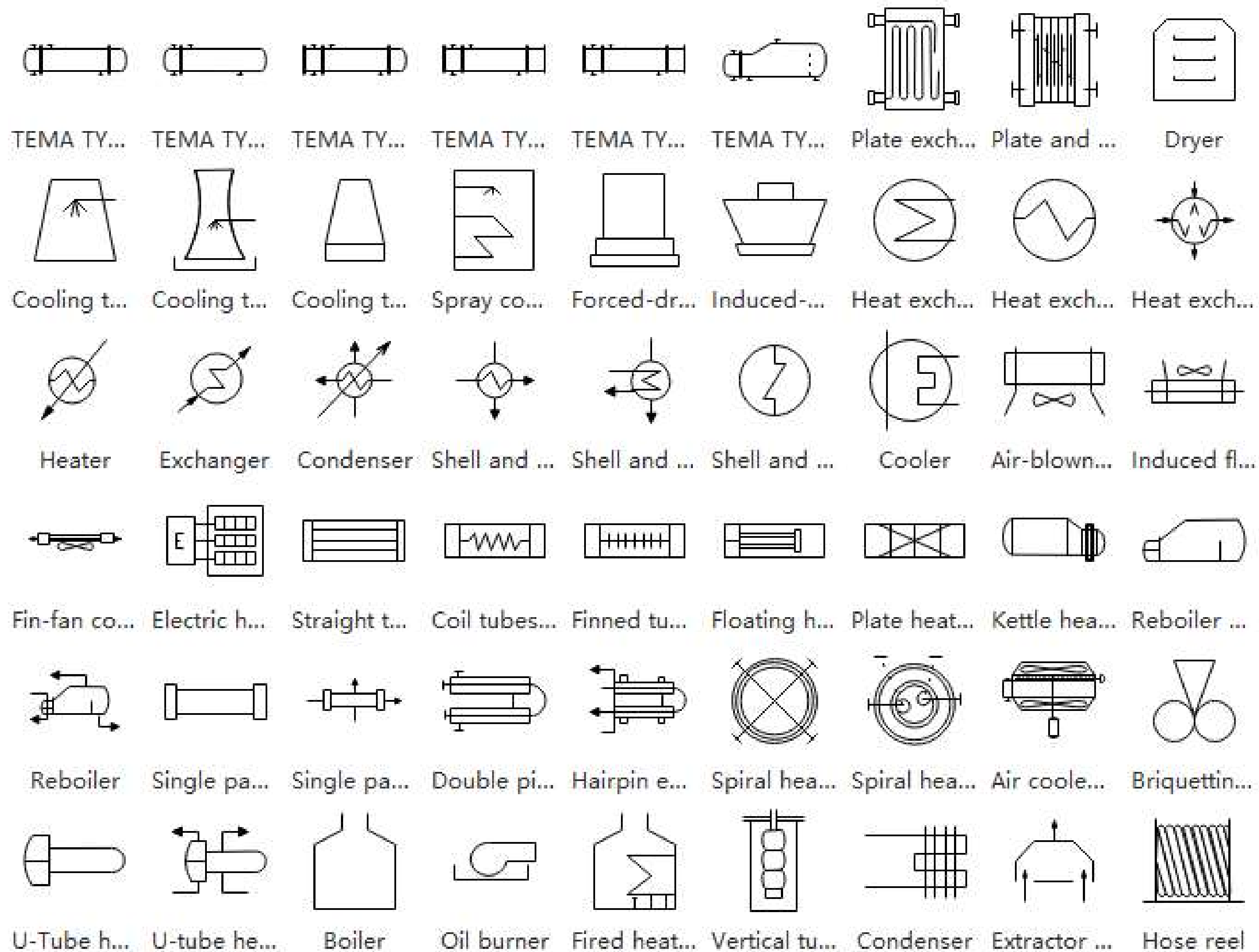
PIPING DRAWINGS

PFD symbols – Recipients



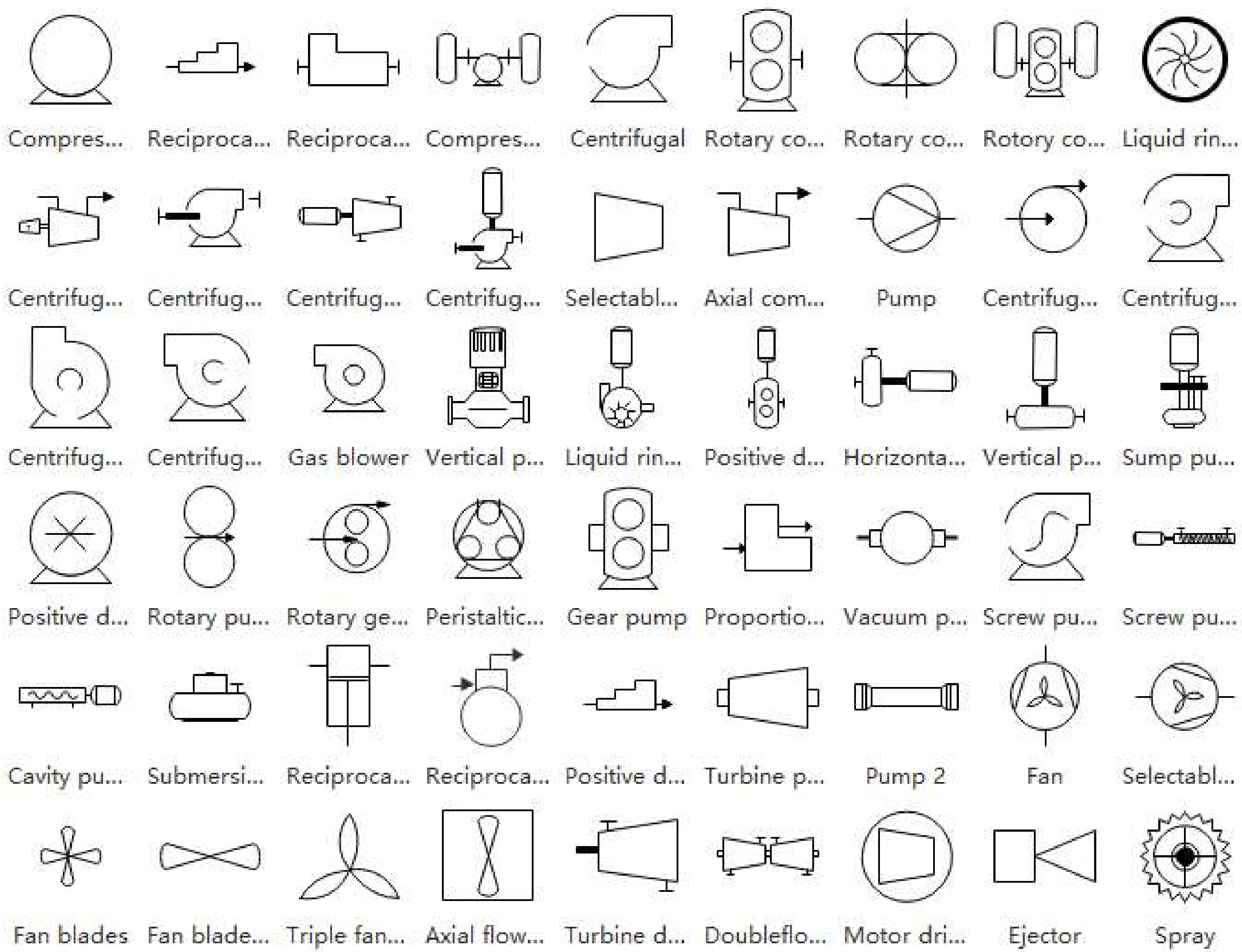
PIPING DRAWINGS

PFD symbols – Heat Exchangers



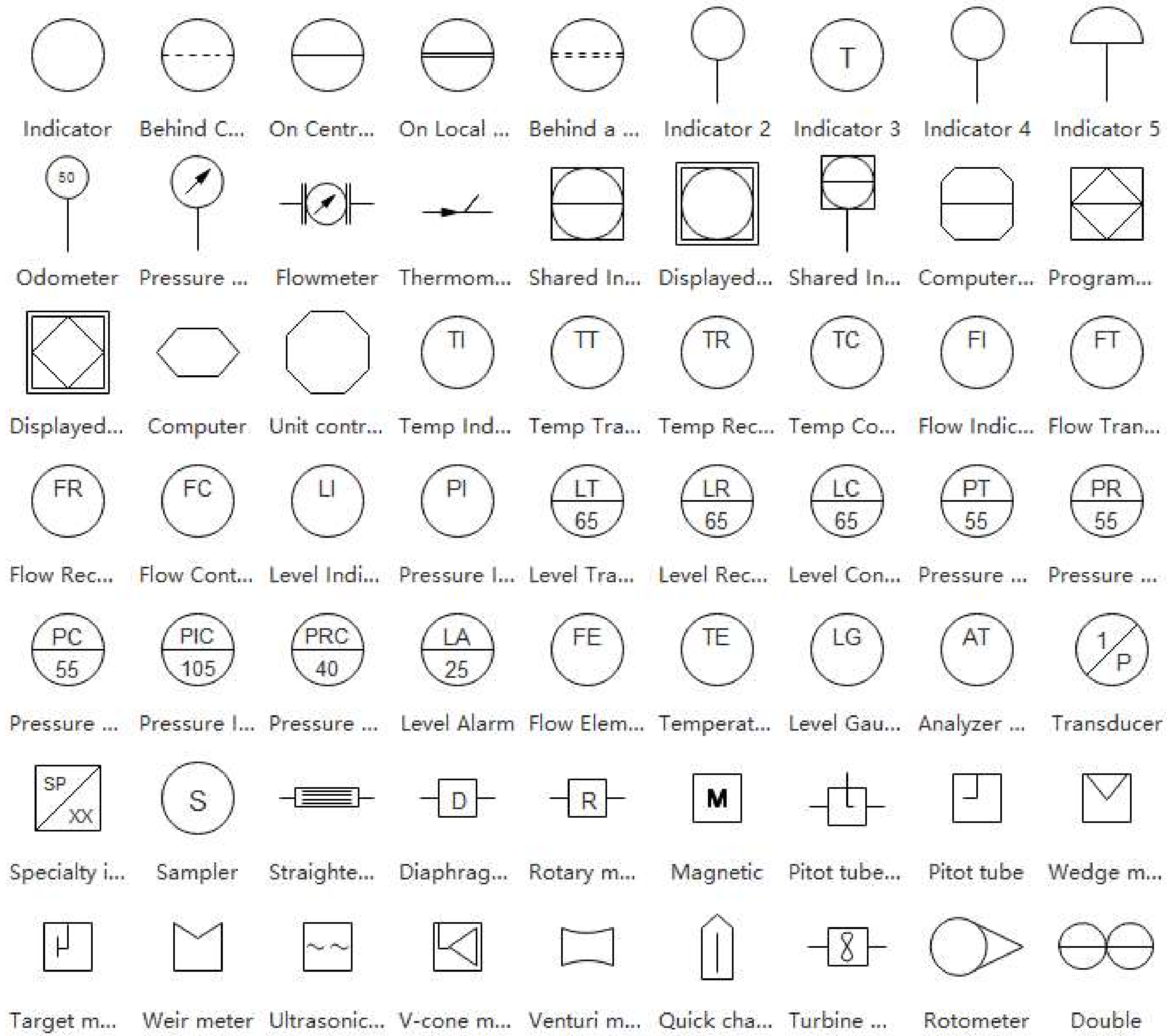
PIPING DRAWINGS

PFD symbols – Pumps



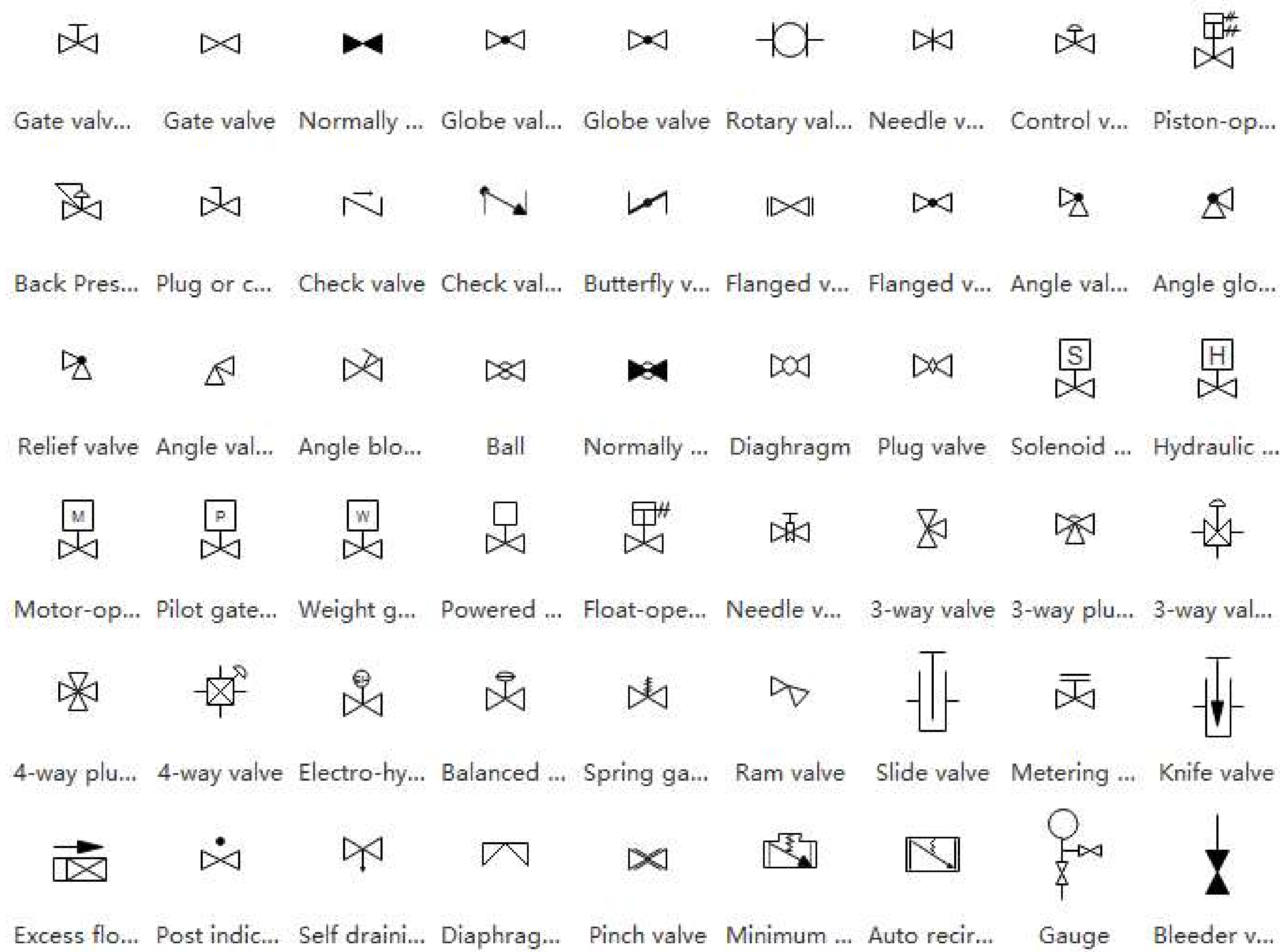
PIPING DRAWINGS

PFD symbols – Instruments



PIPING DRAWINGS

PFD symbols – Valves



PIPING DRAWINGS

The following diagrams are examples of class and commercial process flow diagrams (PFD's). The content depends on the goals for the communication. Unless there are reasons to the contrary, the standard is:

- All major equipment
- All major process lines
- All major utility lines involving material flow
- All stream numbers, temperatures, pressures, flows
- All major process controls and valves
- All equipment sizes with relevant MEB information as required
- All equipment names and numbers

PIPING DRAWINGS

The goal is to present the most amount of information with the least amount of effort on the part of the reader.

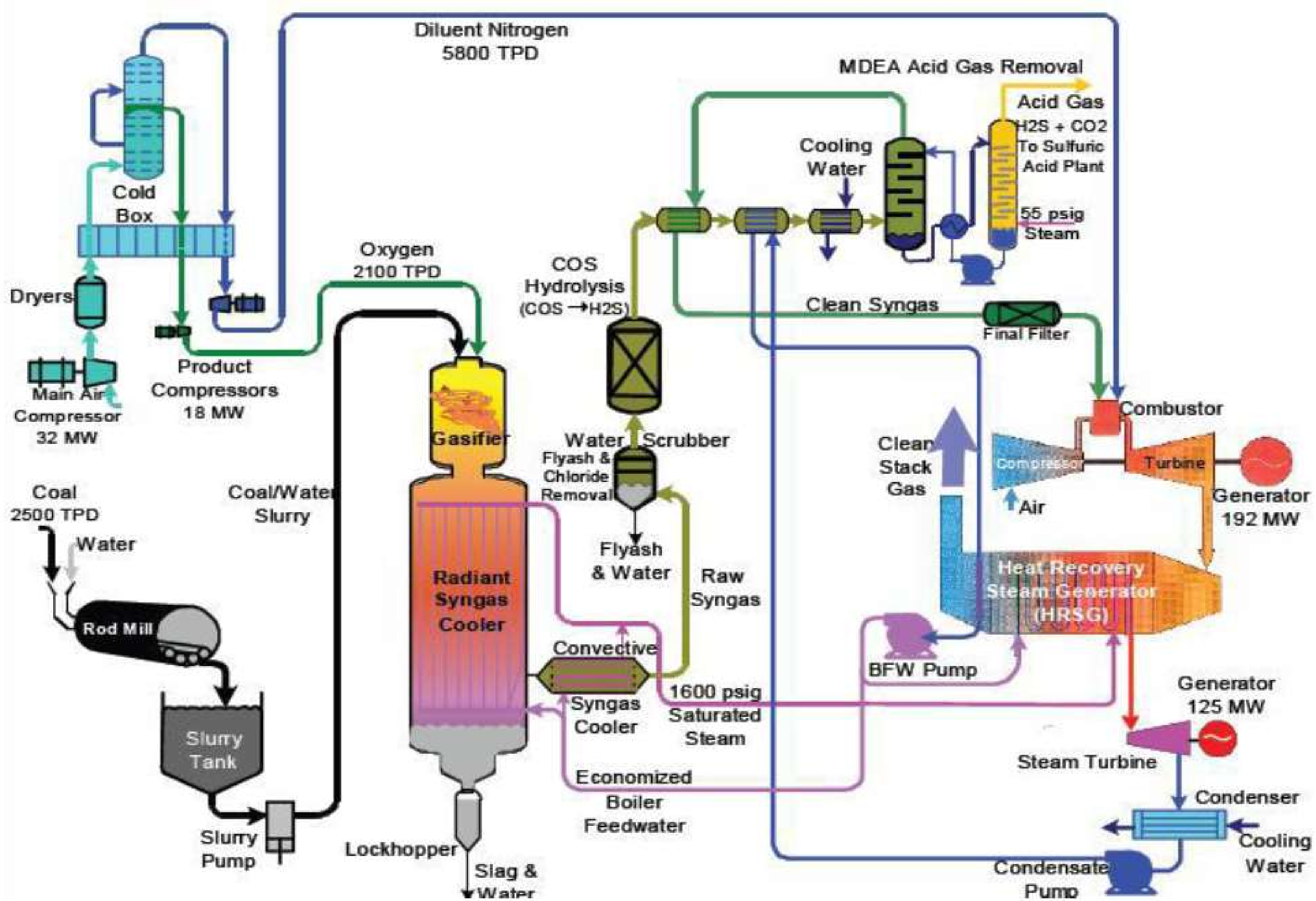
- The flowsheet should generally flow from left to right.
- The flowsheet should not be cluttered -use multiple sheets.
- The flowsheet should be in landscape with the bound edge at top.
- The equipment should be drawn in approximately relative size, e.g. towers larger than drums, exchangers larger than pumps etc,
- The major towers and reactors are generally on one, or nearly one, level.

PIPING DRAWINGS

The goal is to present the most amount of information with the least amount of effort on the part of the reader.

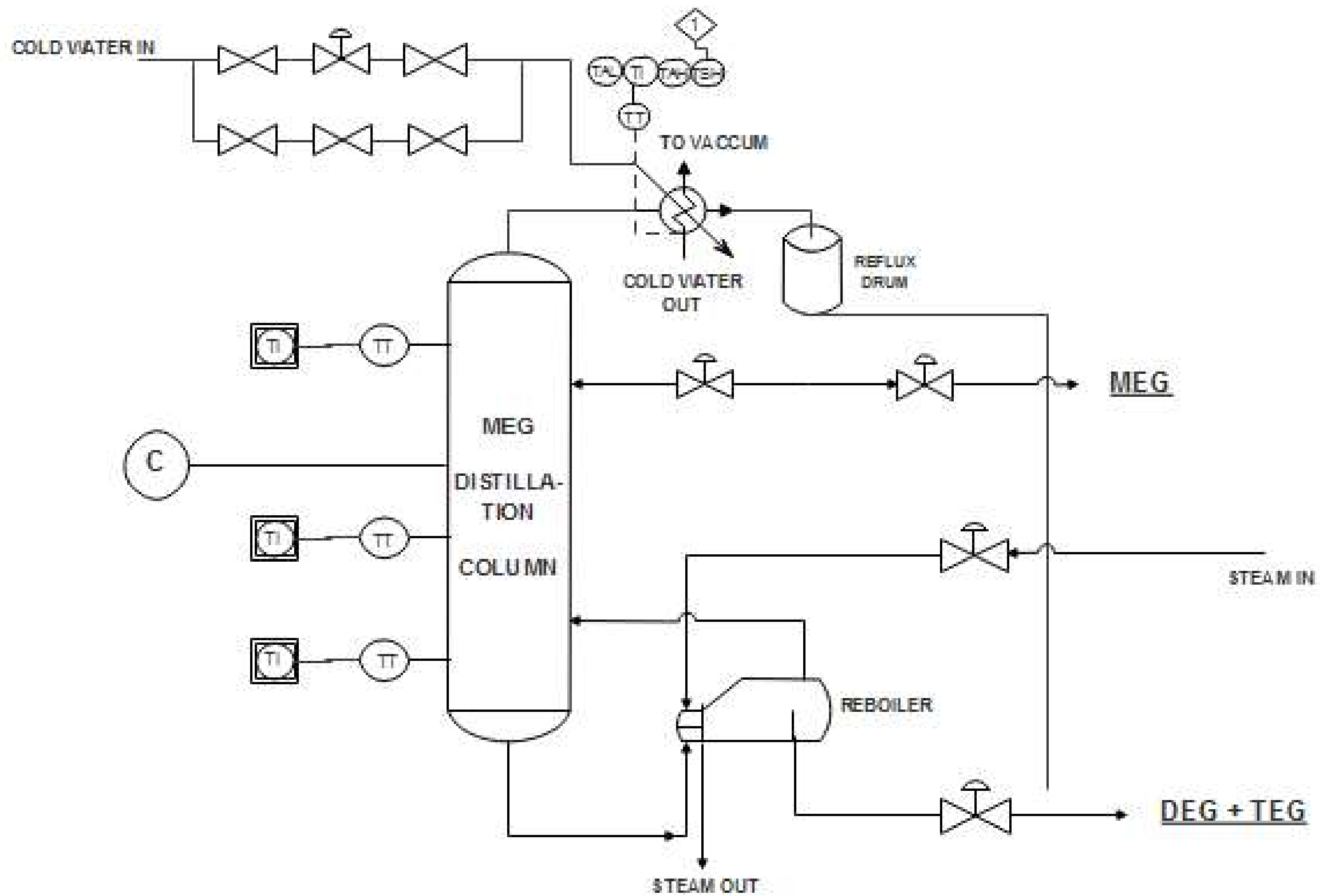
- The flowsheet should generally flow from left to right.
- The flowsheet should not be cluttered -use multiple sheets.
- The flowsheet should be in landscape with the bound edge at top.
- The equipment should be drawn in approximately relative size, e.g. towers larger than drums, exchangers larger than pumps etc.
- The major towers and reactors are generally on one, or nearly one, level.
- The reader should be able to follow it with his or her eye.
- The streams should have the minimum of direction changes.
- The streams that enter a cross the battery limits should be on the left.
- The streams that leave across the battery limits should be on the right.
- The streams that move to the next sheet should leave on the right.
- The streams that recycle to earlier sheets should leave on the left.

PIPING DRAWINGS



PIPING DRAWINGS

Water Boiling Process



PIPING & INSTRUMENTATION

DIAGRAM / DRAWINGS

P & ID

PIPING DRAWINGS – P & ID

A diagram in the process industry which shows the piping of the process flow to get her with the installed equipment and instrumentation

A diagram which shows the interconnection of process equipment and the instrumentation used to control the process.

In the process industry, a standard set of symbols is used to prepare drawings of processes.

The instrument symbols used in these drawings are generally based on International Society of Automation (ISA) Standard S5.1.

The primary schematic drawing used for laying out a process control installation.

P&ID s play a significant role in the maintenance and modification ofthe process that it describes.

- It is critical to demonstrate the physical sequence of equipment and systems, as well as how these systems connect.

- During the design stage, the diagram also provides the basis for the development of system control schemes, allowing for further safety and operational investigations, such as the hazard and operability study(HAZOP)

PIPING DRAWINGS – P & ID

For processing facilities, it is a pictorial representation of

- Key piping and instrument details
- Control and shutdown schemes
- Safety and regulatory requirements
- Basic start up and operational information
- Instrumentation and designations
- Mechanical equipment with names and numbers
- All valves and their identifications
- Process piping, sizes and identification

PIPING DRAWINGS – P & ID

- Miscellanea vents, drains, special fittings, sampling lines, reducers, increasers and swages
- Permanent start-up and flush lines
- Flow directions
- Interconnections references
- Control inputs and out puts, interlocks
- Interfaces for class changes
- Computer control system input
- Identification of components and subsystems delivered by others

PIPING DRAWINGS – P & ID

What information can you get?

For Equipment

- Outline / Internals

For Piping

- Line No. / Size / Material / Insulation / Line Configuration / Piping

Component Type

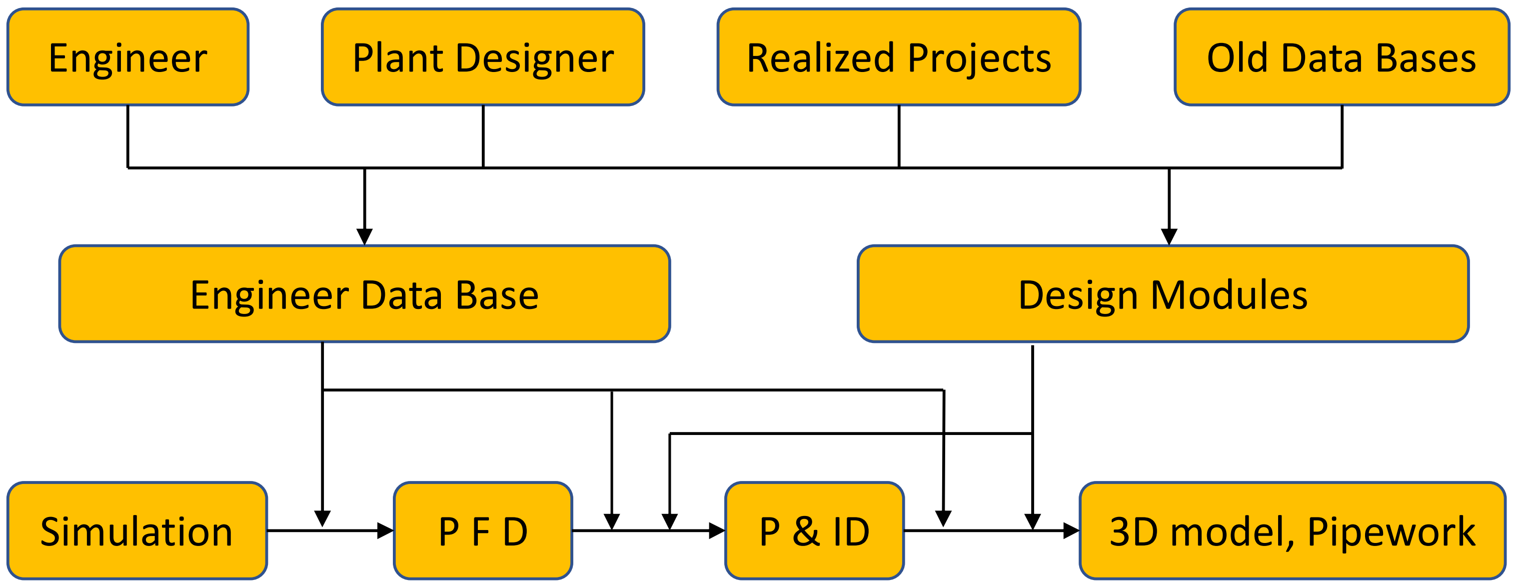
For Instrument

- Tag No. / Function / Control Method

PIPING DRAWINGS – P & ID

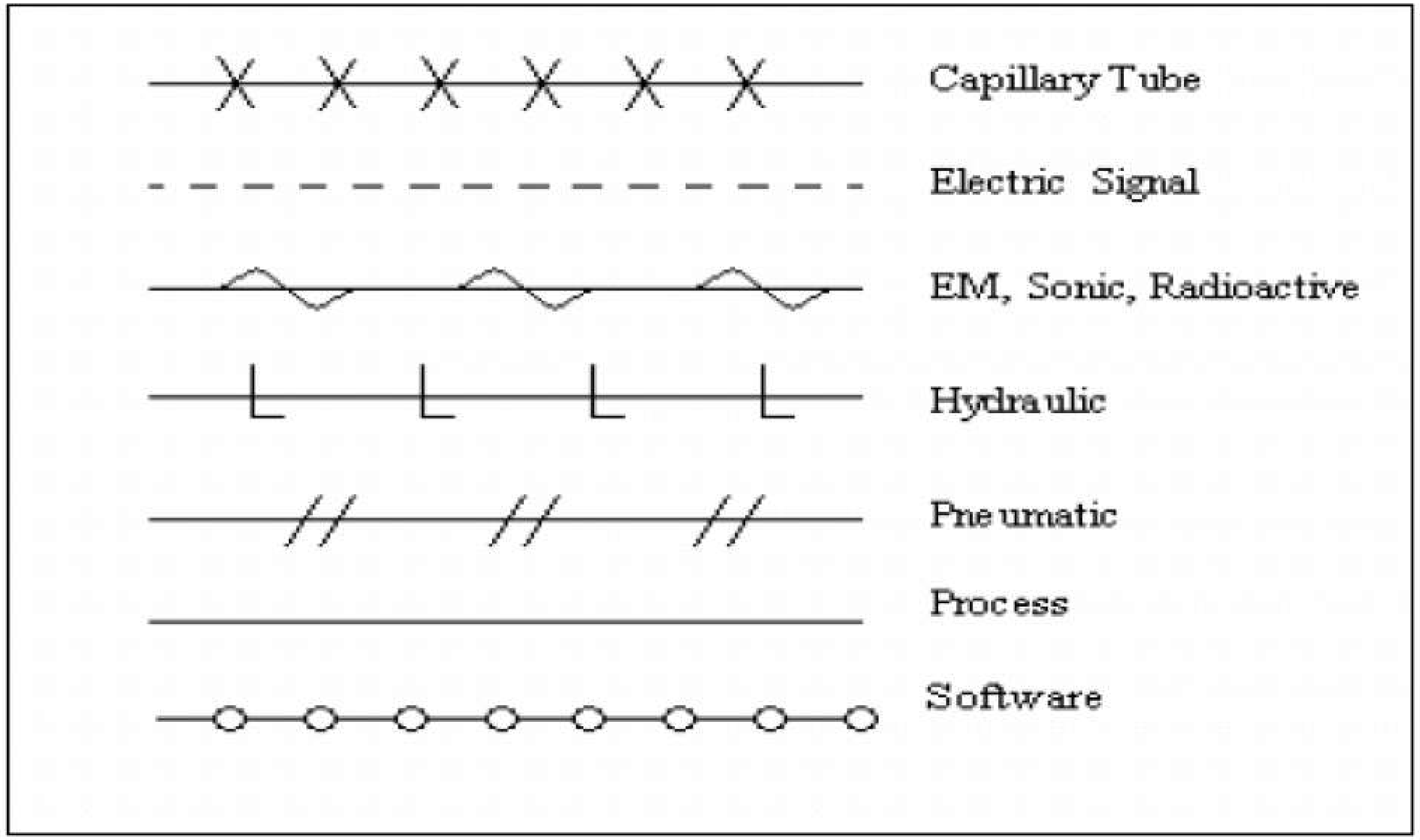
P&ID is used for

- Detail Engineering of each disciplines Piping layout / Material Purchase Instrument Logic / DCS Plan, etc
- Planning of Construction / Commissioning / Plant Operation / Maintenance



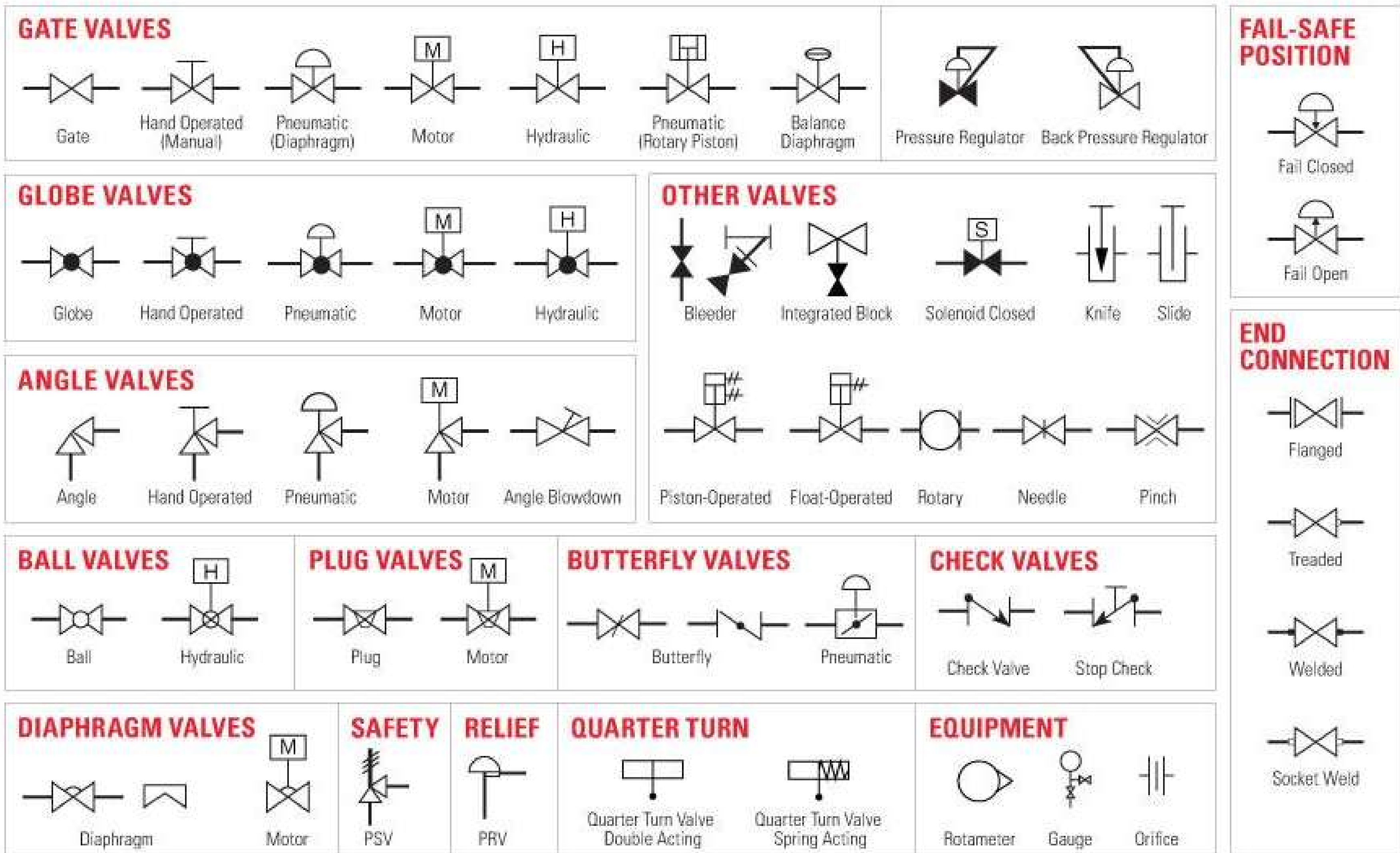
PIPING DRAWINGS – P & ID

P & ID symbols



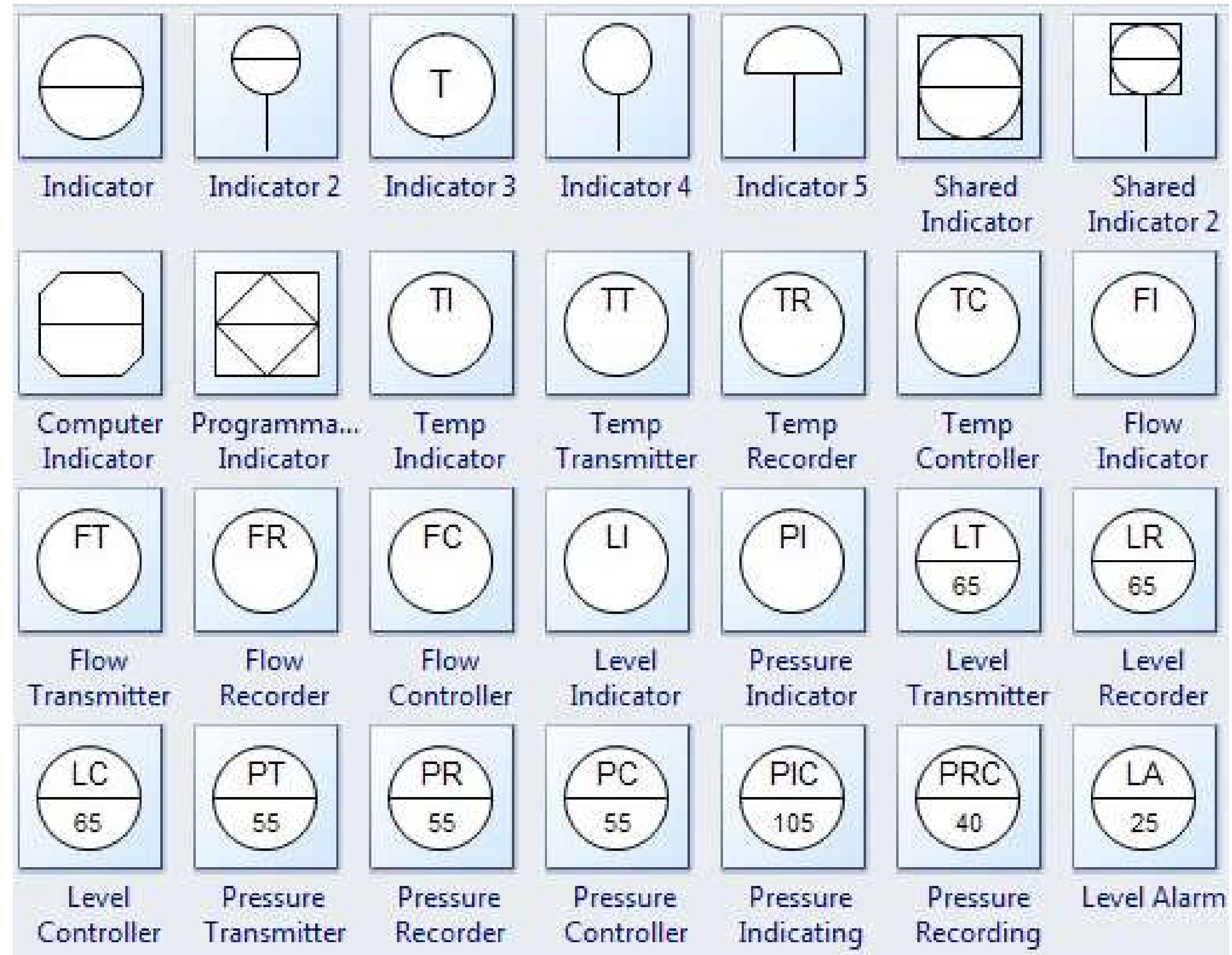
PIPING DRAWINGS – P & ID

P & ID symbols

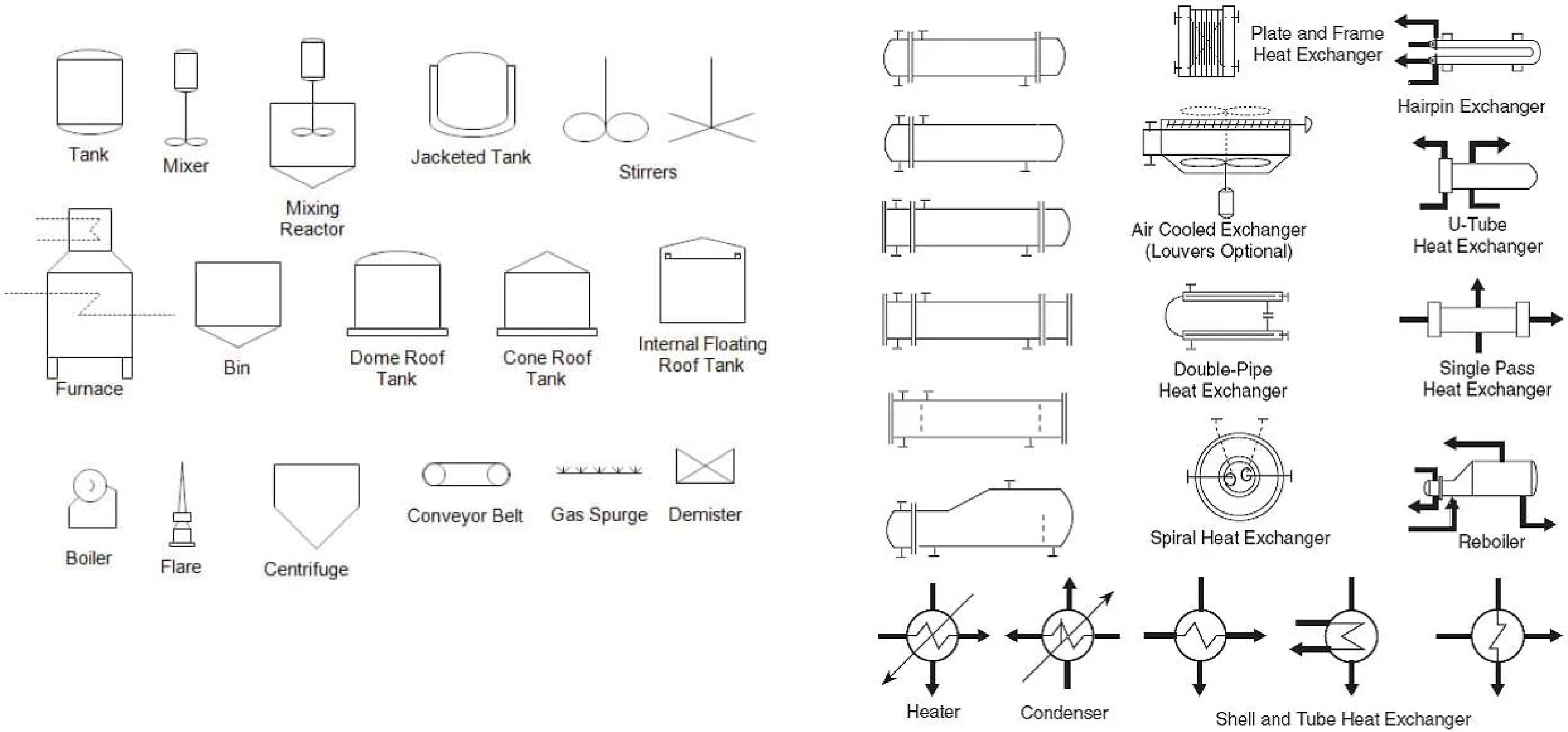


PIPING DRAWINGS – P & ID

Mesured Variable	Type of Conditioner	Type of Component
F = Flow	R = Recorder	T = Transmitter
L = Level	I = Indicator	M = Modifier
P = Pressure	C = Controller	E = Element
Q = Quantity	A = Alarm	
T = Temperature		

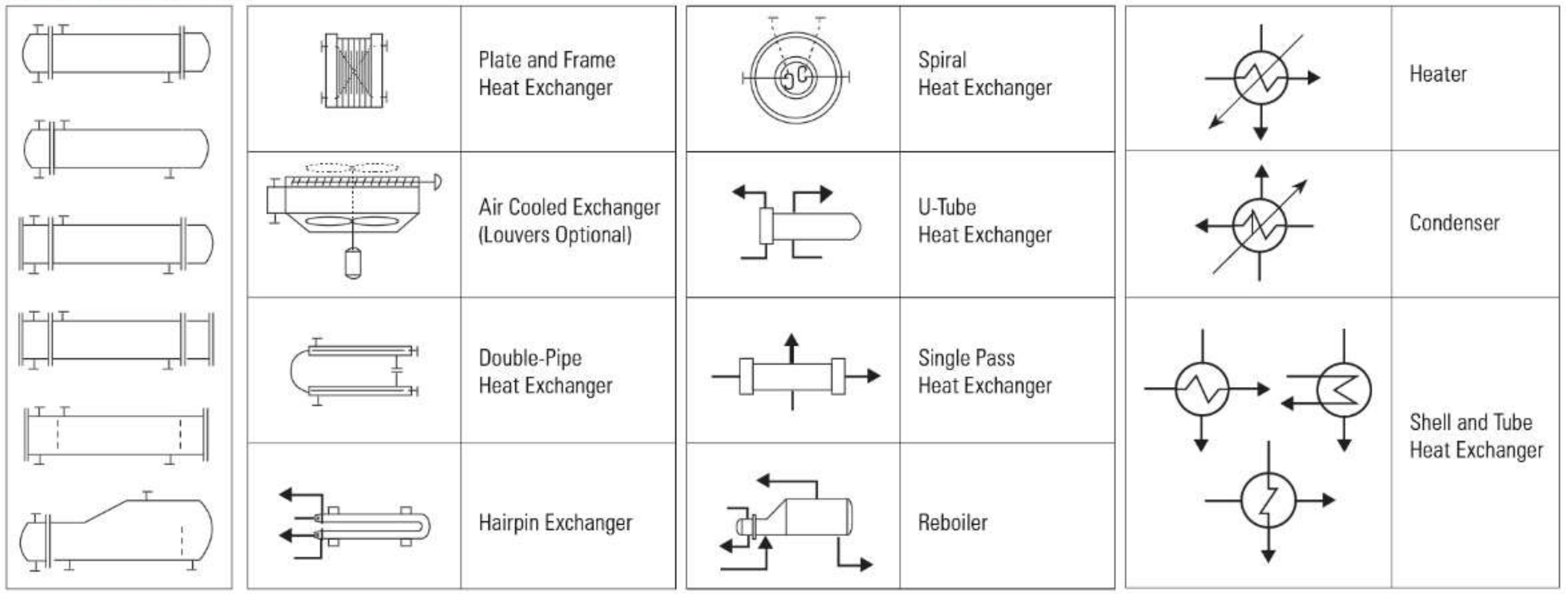


PIPING DRAWINGS – P & ID

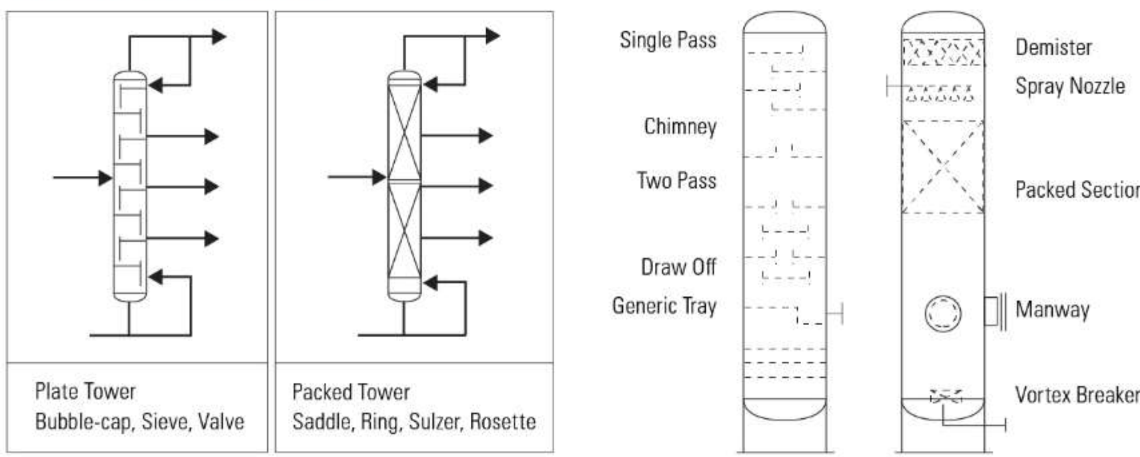


PIPING DRAWINGS – P & ID

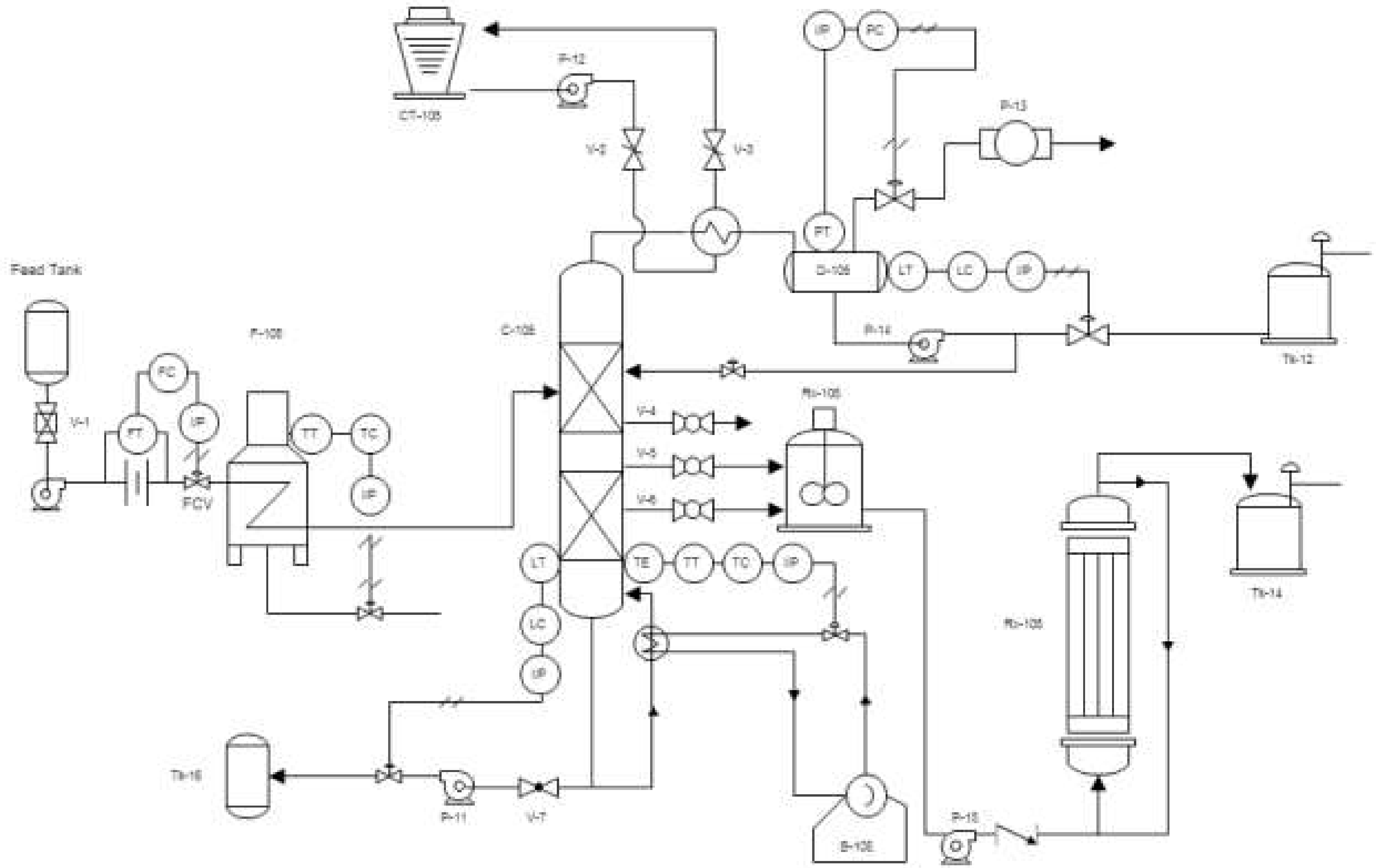
HEAT EXCHANGERS



DISTILLATION SYMBOLS



PIPING DRAWINGS – P & ID



PIPING DRAWINGS – P & ID

- Place equipment and its components
- Connect main piping
- Complete control valve loop
- Place other instrument and connect signals
- Indicate safety devices incl. alarm
- Place piping components (Valve/Fitting) as required
- Check detail and add items required incl. vent/drain connection

GENERAL ARRANGEMENT DRAWINGS

GENERAL ARRANGEMENT DRAWINGS

General Arrangement drawings for piping systems and equipments are developed by piping designers. These drawings indicate the locations of main equipments in the plant. The main piping items, valves, and fittings are also indicated in the General Arrangement or GA drawings. Most often the piping is indicated using a top-view. Sometimes a side view of the piperack is also presented on the GA drawing.

General arrangement drawings are also developed for individual equipments. These drawings present the main dimensions of that equipment using 2D views, top-view, side-view and sometimes front-view. All the nozzles for concerned equipment are indicated on the equipment General Arrangement or GA drawing. For a green field engineering project, equipment location drawings are prepared at the proposal stage by piping designers. On commencing the project work, these drawings are used as first basis for development of piping layout.

Depending on the feasibility of the piping layout arrangement, often the equipment locations are revised and updated. The changes to equipment location can sometimes be substantial in order to have the desired piping arrangement. Thus piping layout arrangement and development of piping general arrangement or GA drawings is dependent on reference sources developed prior to the piping arrangement work and modifications required to those references to allow for the desired piping layout arrangement.

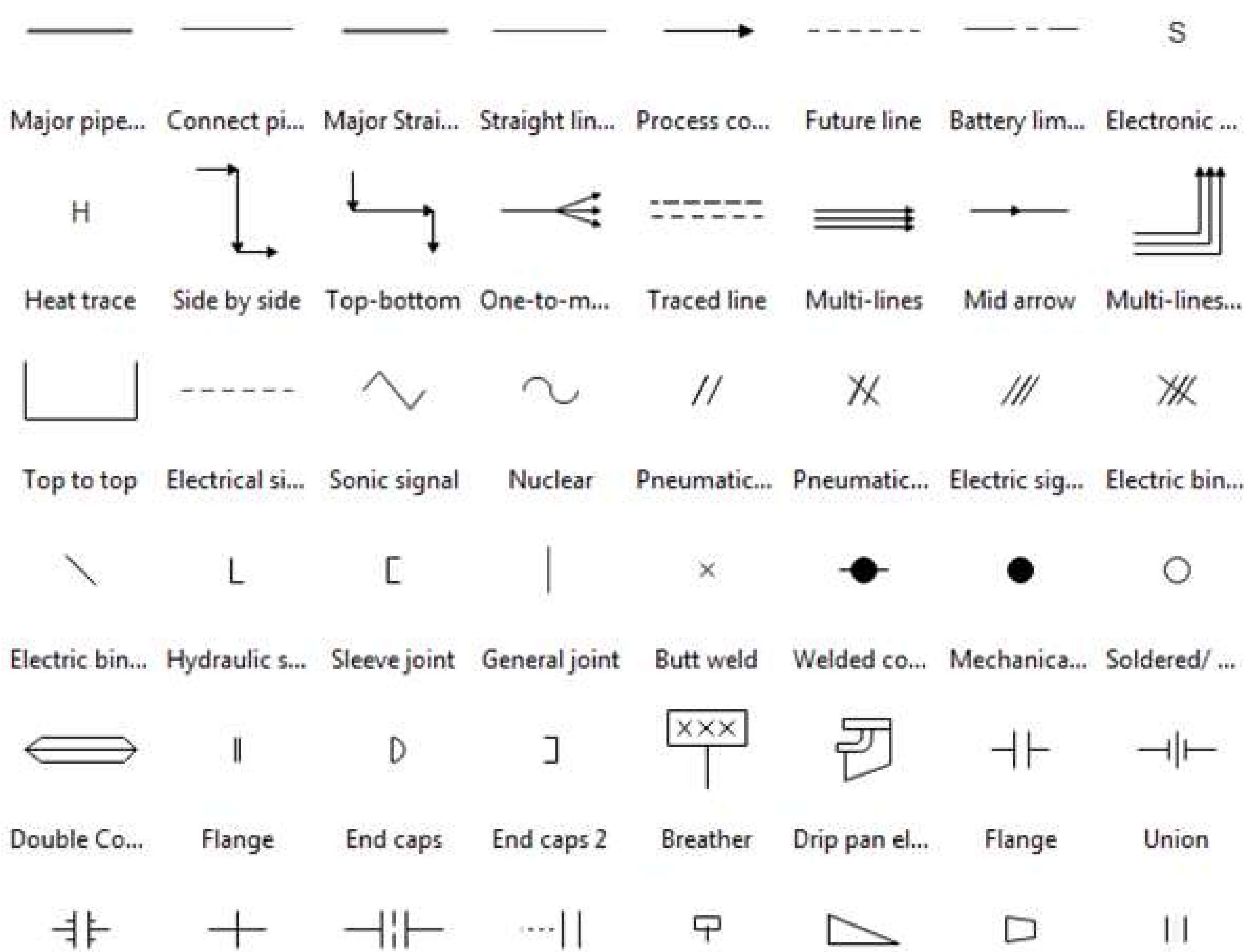
PIPING GENERAL ARRANGEMENT DRAWING CHECK LIST

PIPING GENERAL CHECK LIST

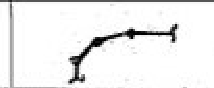
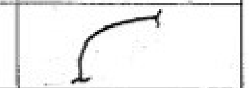
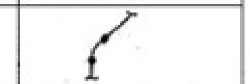
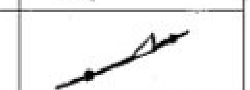
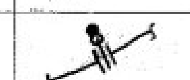
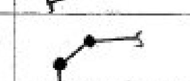
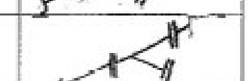
- Title Block
- North Arrow Orientation.
- Match line Continuation.
- Line Continuation.
- Equipment Location To Grid.
- Equipment Nozzle Details (No., Size & Rating).
- Pipeline Location To Grid/Equipment. By Piping Or Valves).
- Structural Penetrations.
- Locations Of Item.
- Pipeline Elevations Shown.
- Dimensional Completion.
- Valve Orientation. (is enough space provided for:)
- Electrical And Instrument Cable Trays And Junction Boxes.
- Erection Of Equipment.
- Tube Bundles.
- Maintenance Space (Including Choke And Safety Valves).
- Equipment Removal.
- Operating Space.
- Manway Clearance.
- Davit Dropping.
- Overhead Clearance.
- Future Installation Area.
- Ducting And H.V.A.C. Equipment.
- Platforms And Walkways (I.E. Not Blocked By Piping Or Valves)
- Do Drawing Comply With Piping & Instrument Diagrams And Line List
- Direction Of Flow And Flow Arrows.
- Valve And Specialties In Each Line.
- Instrument Conn's In Lines And Equipment.
- Steam/Electric Tracing.
- Insulation.
- Equipment Numbers And Titles.
- Completeness Of Lines.
- Pipeline Numbers.
- Instrument Tag Numbers.
- Valve Tag Numbers.

PIPING DRAWING
G.A. SYMBOLS

PIPING DRAWINGS – G.A. SYMBOLS



PIPING DRAWINGS – G.A. SYMBOLS

SR. NO.	DESCRIPTION	ISO SYMBOL	SR. NO.	DESCRIPTION	ISO SYMBOL
1	Pipe		17	90⁰ Mitre Elbow (3 - cut)	
2	Traced Line		18	Pulled Bend (any angle)	
3	Jacketted line		19	90° Elbow or Bend other than butt weld & Flanged	
4	Flow Direction		20	90° Elbow or Bend Butt Weld	
5	Pipe Slope		21	90° Elbow or Bend Flanged	
6	Existing / Hidden / Underground Lines		22	Tee Butt Weld	
7	Match Line		23	Tee Flanged	
8	Battery Limit		24	Coupling, Half-Coupling	
9	Butt Weld		25	Reducer Conc.	
10	Field Weld (Site Weld)		26	Reducer Ecc.	
11	Weld Neck		27	Swage Nipple Conc.	
12	Slip-on-Flange		28	Swage Nipple Ecc.	
13	SCRD, Socket Weld & Blind Flange		29	Flgd. Reducer Conc.	
14	Lap Jt. Flange		30	Flgd. Reducer Ecc.	
15	Spectacle Blind		31	Strainer (Butt Weld)	
16	90⁰ MITRE ELBOW (2-Cut)		32	Strainer (Flanged)	

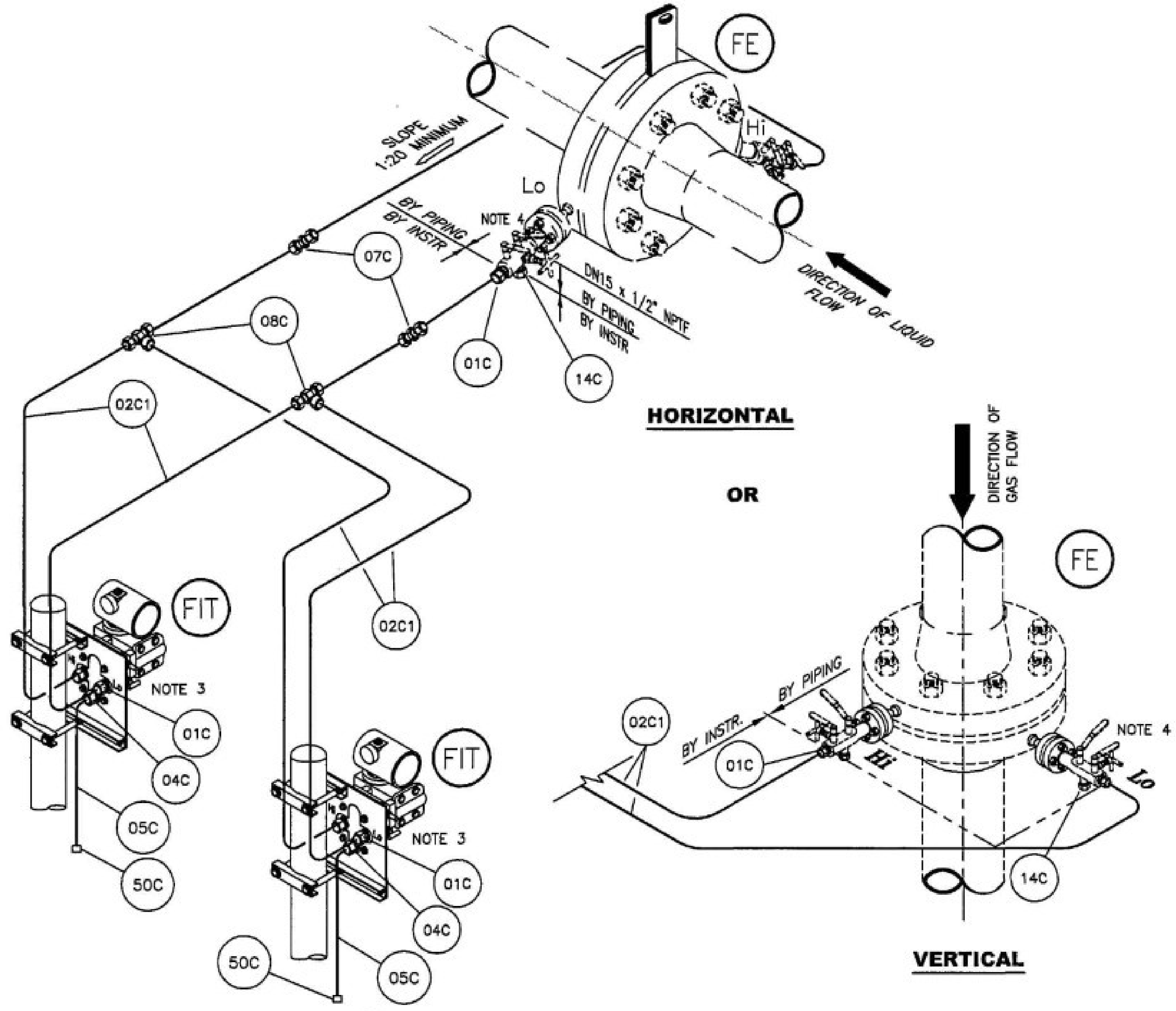
PIPING DRAWINGS – G.A. SYMBOLS

Valve Types	Butt Welded	Socket Welded	Threaded
Gate			
Globe			
Ball			
Plug			
Butterfly			...
Needle			
Diaphragm	...		
Y Type			
Three Way			
Check			

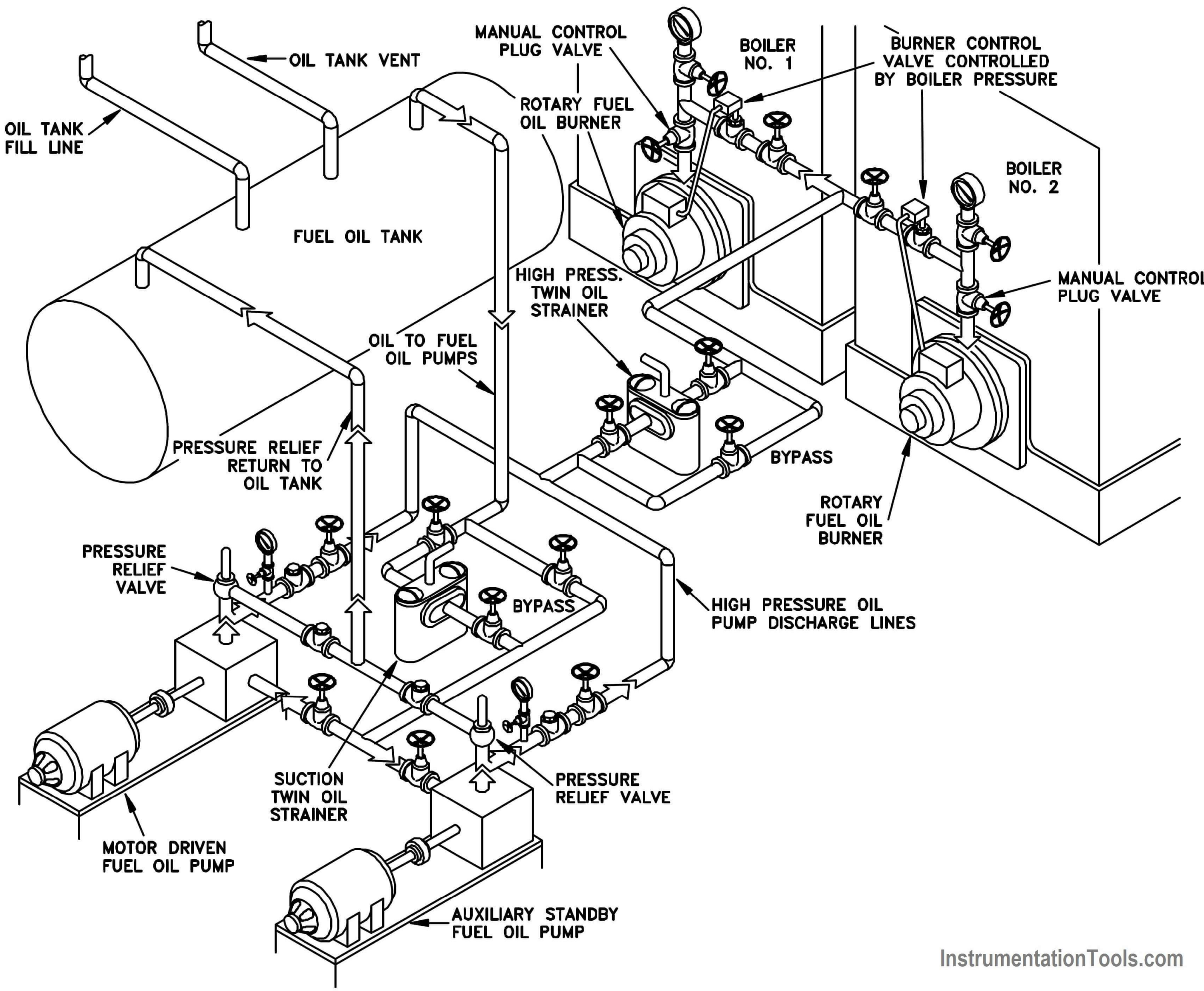
Fitting Types	Butt Welded	Socket Welded	Threaded
90° Elbow			
45° Elbow			
Equal Tee			
Reducing Tee			
Cap			
Concentric Reducer		...	...
Eccentric Reducer		...	...

Piping Components	Symbols	Piping Components	Symbols
Weld Neck Flange		Field Weld	FW
Socket Weld Flange		Butt Weld	
Threaded Flange		Pipe to Pipe Connection	
Slip On Flange		Nipolet	
Lap Joint Flange		Sight Glass	SGI
Blind Flange		Spacer	
Weldolet		Conical Strainer	
Spade	SP	Relief Valve	
Spectacle Blind	SB	Restriction Orifice	RO
Y Type Strainer		Meter Run Orifice Assembly	

PIPING DRAWINGS – G.A. SYMBOLS



PIPING DRAWINGS – G.A. SYMBOLS



PIPING ISOMETRICS

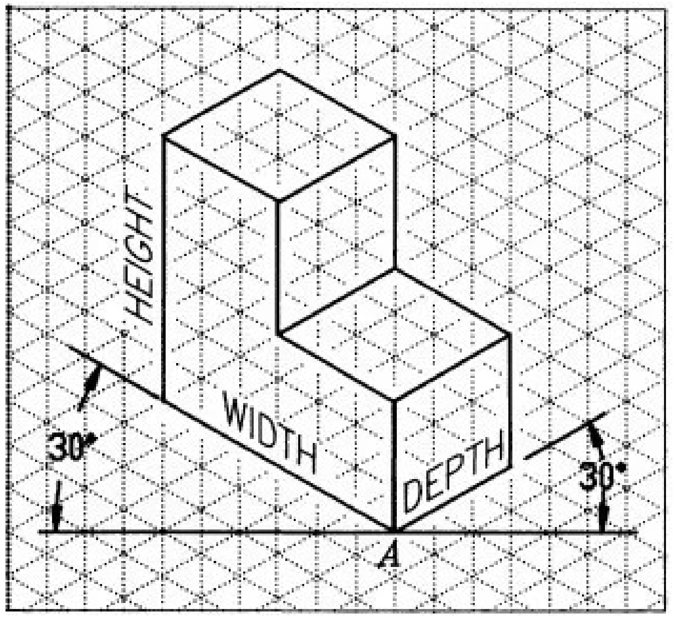
PIPING ISOMETRICS

An isometric drawing is a type of pictorial drawing in which three sides of an object can be seen in one view.

- It’s popular within the process piping industry because it can be laid out and drawn with ease and portrays the object in a realistic view.
- Sometimes it is used in lieu of plans and elevations but typically it is used to supplement the plan drawings.
- Match line continuation.
- Line continuation.
- Isometrics are used as fabrication & shop drawings for pipe run fabrication.
- Isometrics also provide a drafter with the ability to calculate angular offsets in the pipe run.

PIPING ISOMETRICS

By definition, Isometric drawings are a pictorial representation that combines height-width-depth / length into a single view with 30 degrees from its horizontal plane as shown in the below-attached image.



PIPING ISOMETRICS

An isometric Drawing is a two-dimensional (2D) drawing that represents the 3D piping system. The important features are :

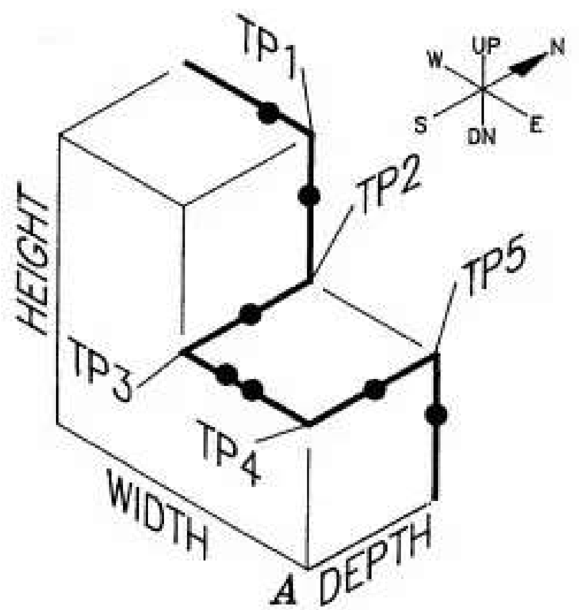
- It is not drawn to the scale, but it is proportionate with the exact dimensions represented.
- Pipes are drawn with a single line irrespective of the line sizes, as well as the other configurations such as reducers, flanges and valves.
- Pipes are shown in the same size. The actual sizes are notified in the Bill of Material, tagging, call-out, or notes.
- A piping isometric drawing provides all the required information like:
    - Pipeline Number
    - Continuation isometric number
    - Flow direction
    - Piping dimensions
    - Piping joint types, weld types
    - Flange and valve types
    - Equipment connection details
    - Piping and Component descriptions with size, quantity, and material codes

Piping Isometric drawing are popular because of their simplicity yet efficiency to convey complex information. The following figure gives an example of how one Isometric drawing can represent three orthographic drawings. That is just a simple piping drawing.
Imagine complex design and yet orthographic drawings are used for construction, that is really a headache.

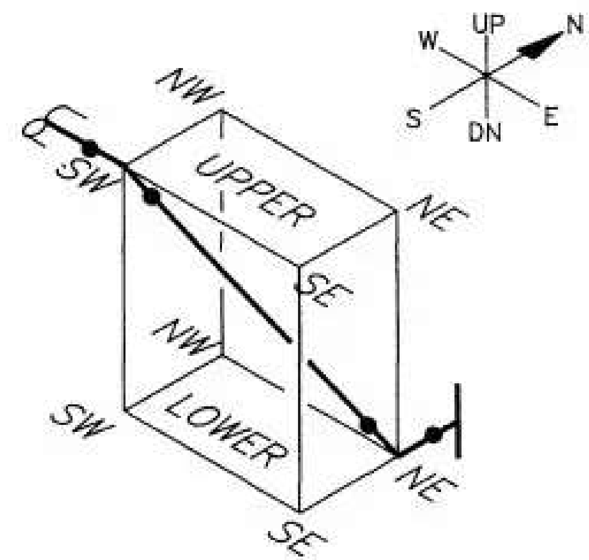
PIPING ISOMETRICS

How to Read Piping Isometric Drawings ?

First, imagine that the piping system is built in a box. This basic imagination is required for the piping to have an offset. So, it will help you to imagine, how the piping configuration will look as it travels.



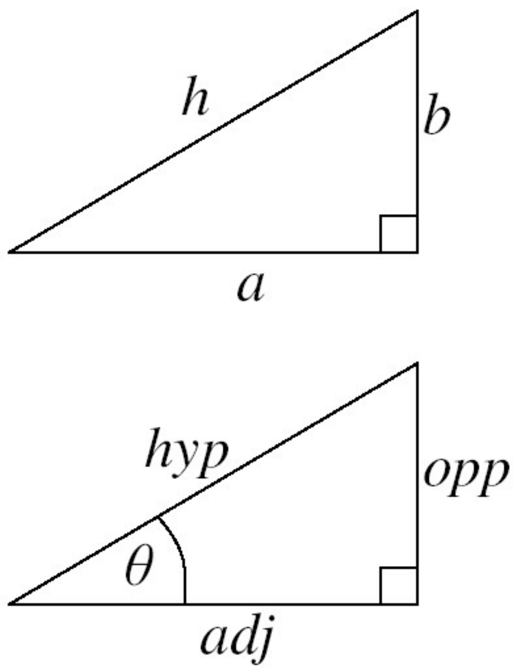
Piping Iso with No Offset



Piping Iso with Offset

PIPING ISOMETRICS

Offset happens when the pipe turns to any angle other than 90 degrees or to accommodate the odd nozzle's location or tie-in point connections. A popular use is a 45-degree elbow and this is used extensively in piping design. In such cases, piping design may land on Northeast, Southeast, Northwest, or Southwest axes. In order to check the dimension of pipe length with offset, common Pythagoras's theorem and Trigonometric rule can be used. A sample calculation is shown below as a reference.



Pythagoras's Theorem

$$a^2 + b^2 = h^2$$

Trigonometric Ratios

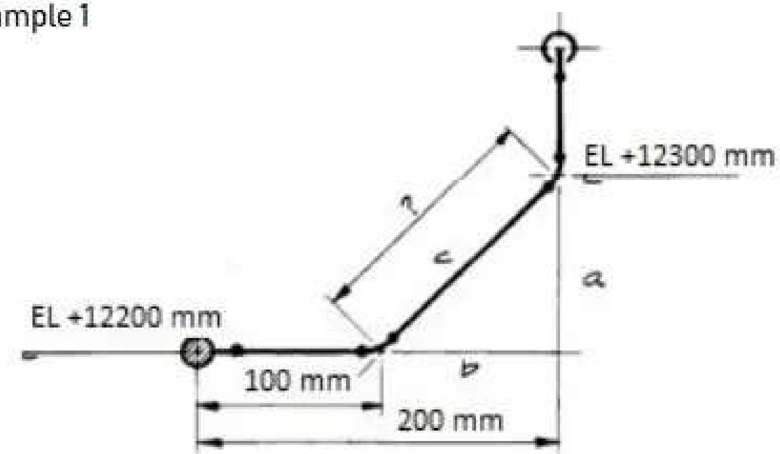
$$\sin(\theta) = \frac{opp}{hyp}$$

$$\cos(\theta) = \frac{adj}{hyp}$$

$$\tan(\theta) = \frac{opp}{adj}$$

PIPING ISOMETRICS

Example 1



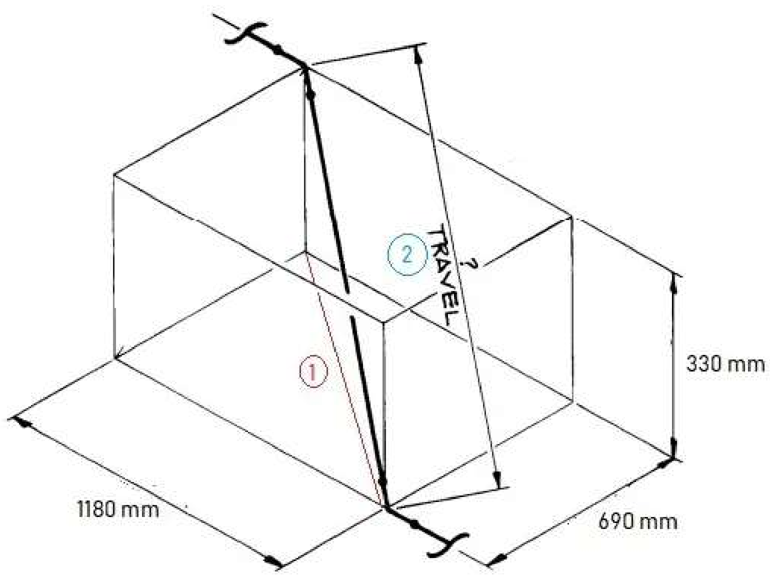
Side a: 12300 – 12200 = 100 mm

Side b: 200 – 100 = 100 mm

Hence c: $\sqrt{(100)^2 + (100)^2}$

c = 141.2 mm

Example 2



To find (1)

$\sqrt{(1180)^2 + (690)^2}$ = 1366.93 mm

To find (2)

$\sqrt{(1366.93)^2 + (330)^2}$ = 1406.20 mm

OR (2) can also be directly calculated by:

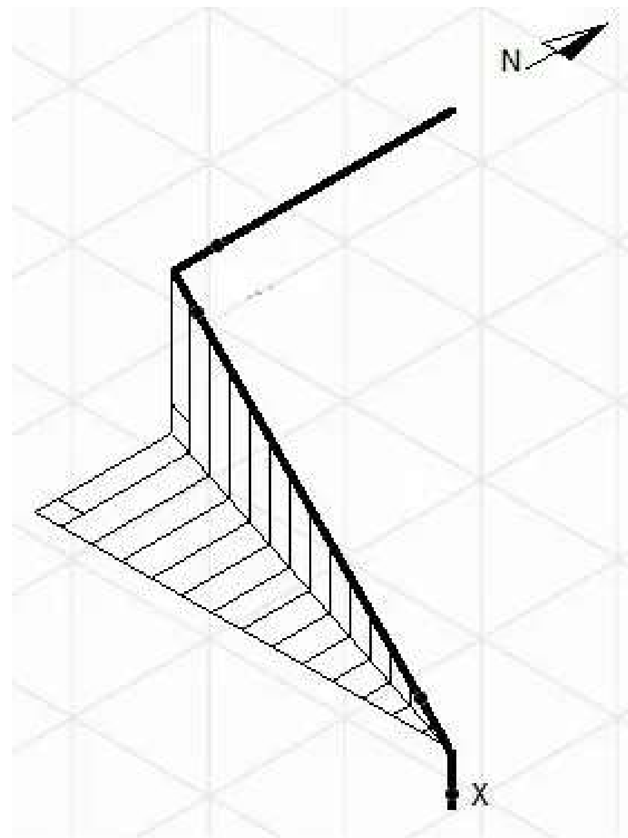
$\sqrt{(330)^2 + (690)^2 + (1180)^2}$ = 1406.20 mm

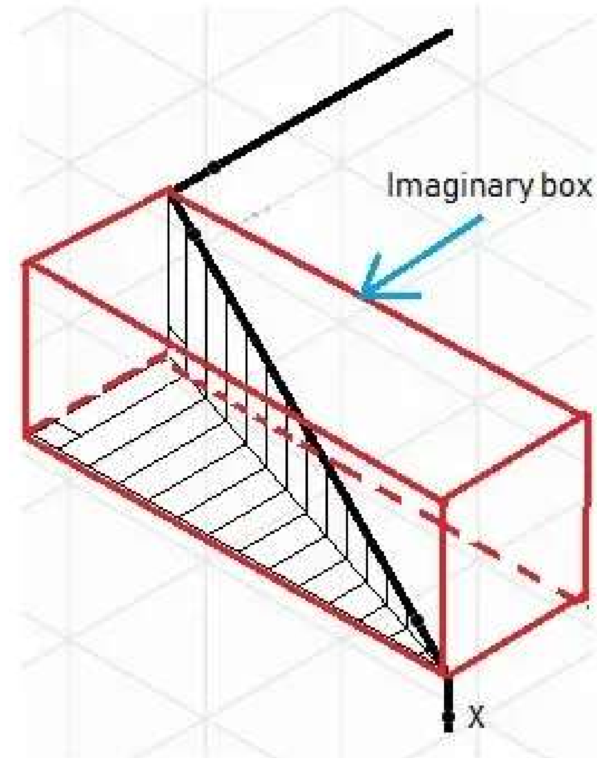
PIPING ISOMETRICS

If you happened to have difficulties reading the offset, try to draw the imaginary box. It could help you in having a better understanding of which axes the pipe travel and how the piping should look like. In the example given, take the flow from ‘x’, the pipe goes up; then up-northwest; then north. As you get along with Iso a lot, things will come naturally.

A north arrow is provided in all piping isometrics to inform the location of the piping system in the piping / general arrangement drawing.

The piping isometrics also has coordinates & elevation detailed information to verify the exact length of the pipe in horizontal and vertical axes respectively. The dimensions in Isometric drawings are measured from the pipe centreline and not from the outer diameter of the pipe (refer to the image attached below for reference).



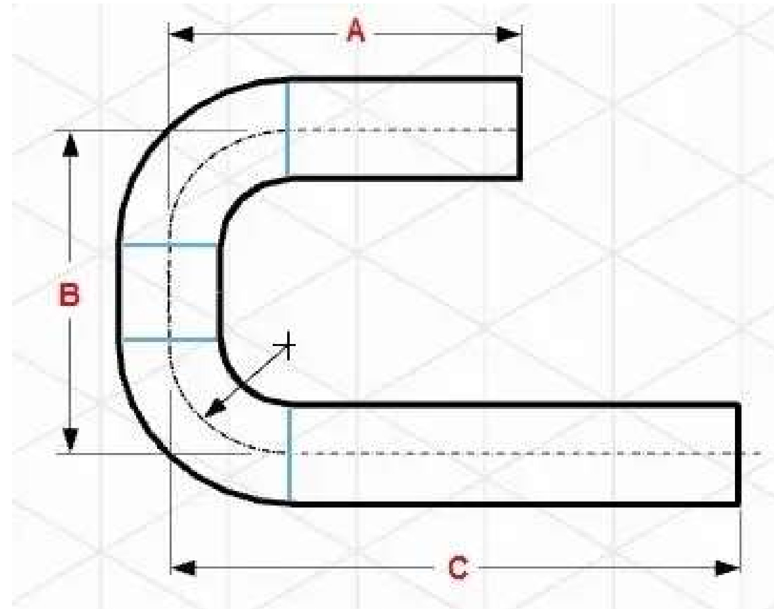


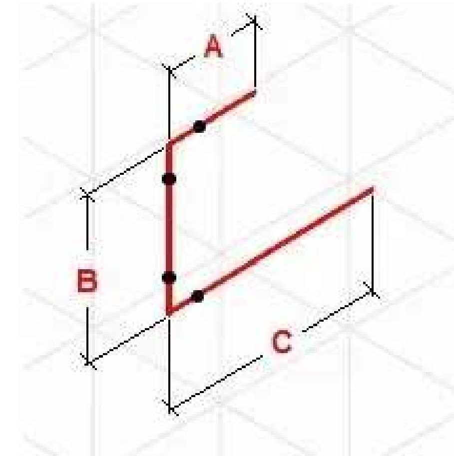
PIPING ISOMETRICS

With the advancement of technology, there could be minimum or even zero possibilities that the North arrow, coordinates, and elevation in Isometric would differ from the piping arrangement; hence the dimensions and MTO (Material Take-Off) should match exactly if the source 3D model is the same.

However, It is always better to check and verify as there could be some issues with the modeling itself that may cause discrepancies in material and quantity. For example, if double piping is modeled by mistake, it will read the double quantity of material.

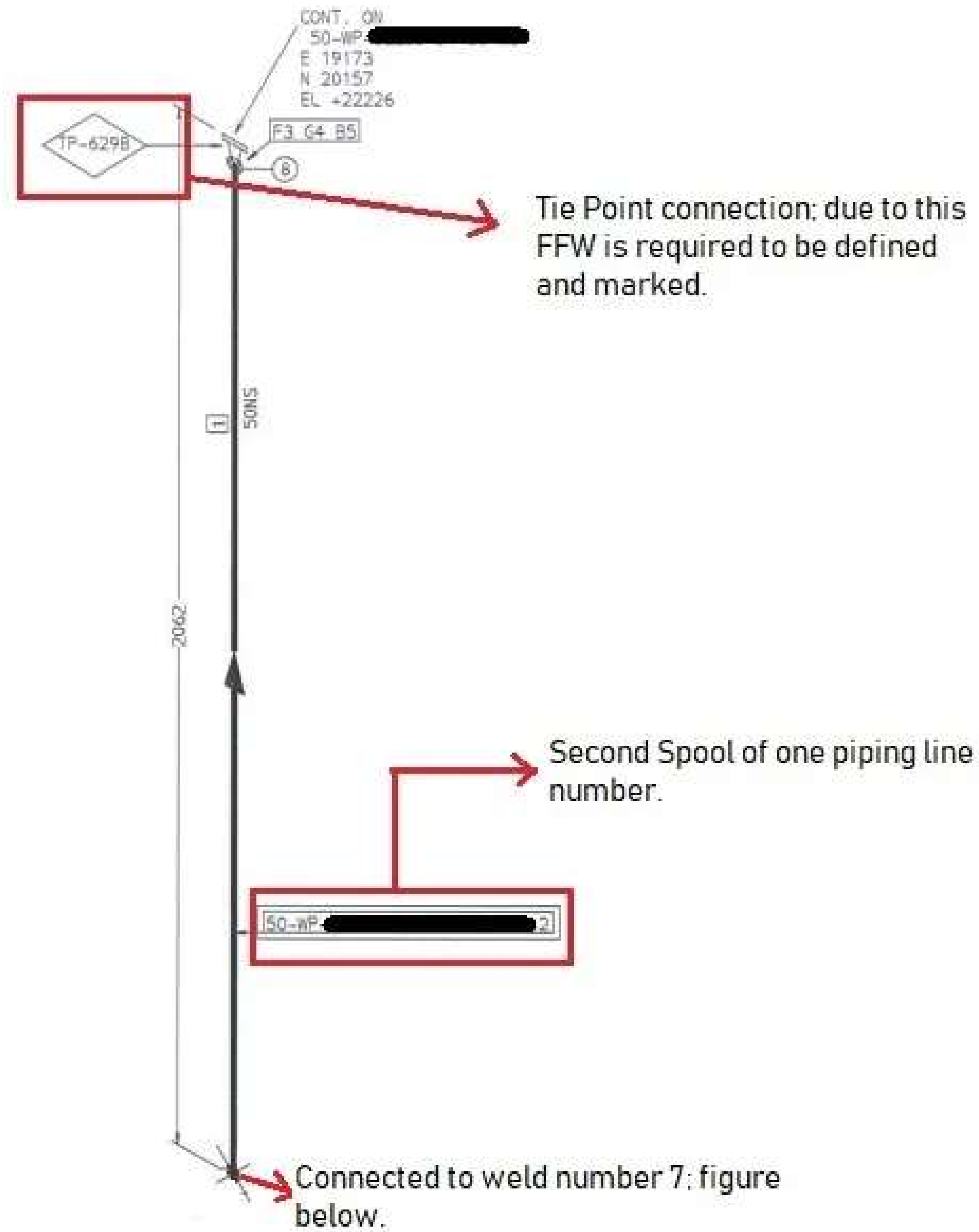
Isometric drawings also inform which piping should be constructed at the fabrication shop and which should be assembled at the construction/platform field itself. The complete piping system is separated into pieces that are transported to the site for erection. These small pipe pieces are termed piping spools. One sheet of Isometric drawing normally has few spools.



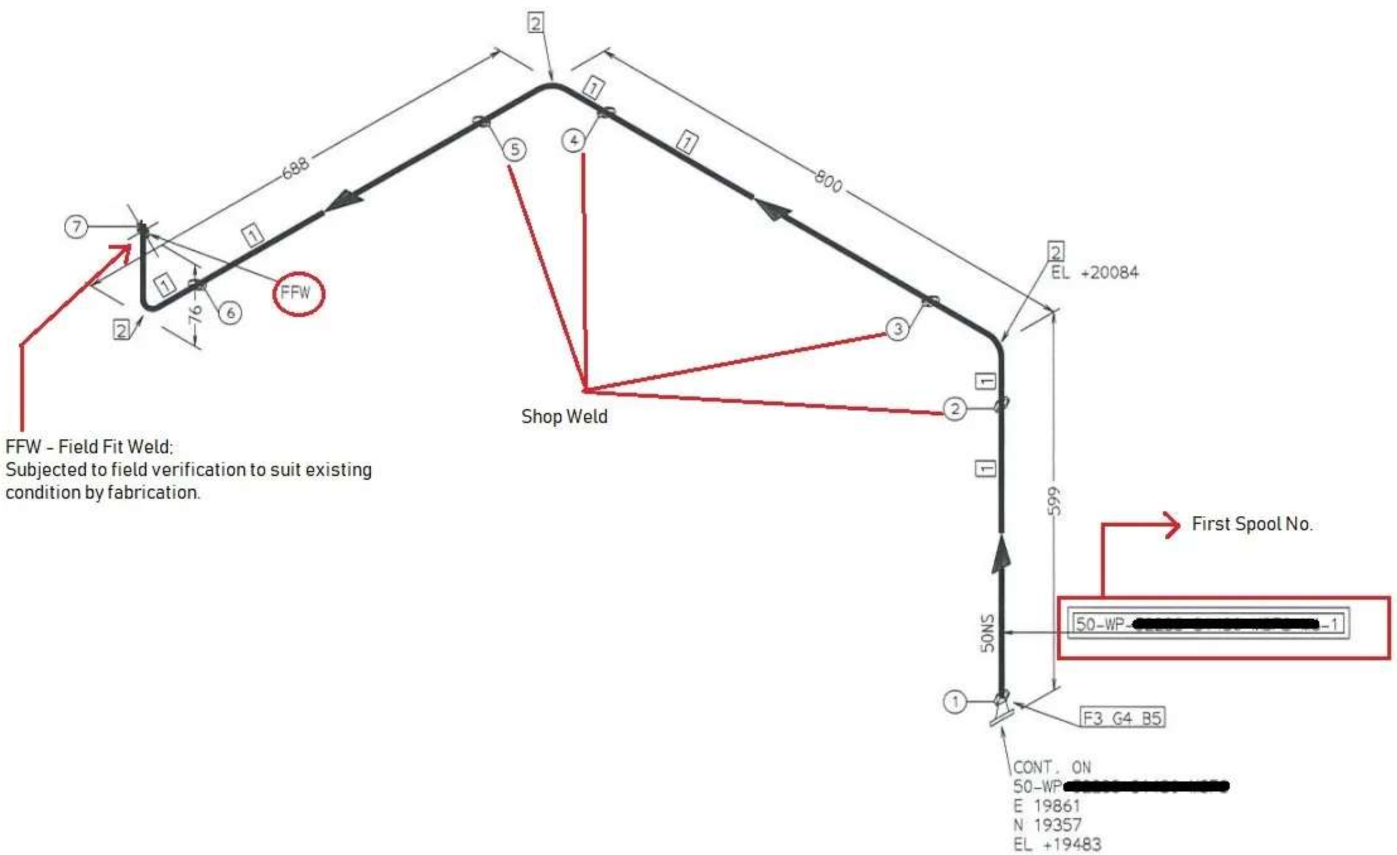


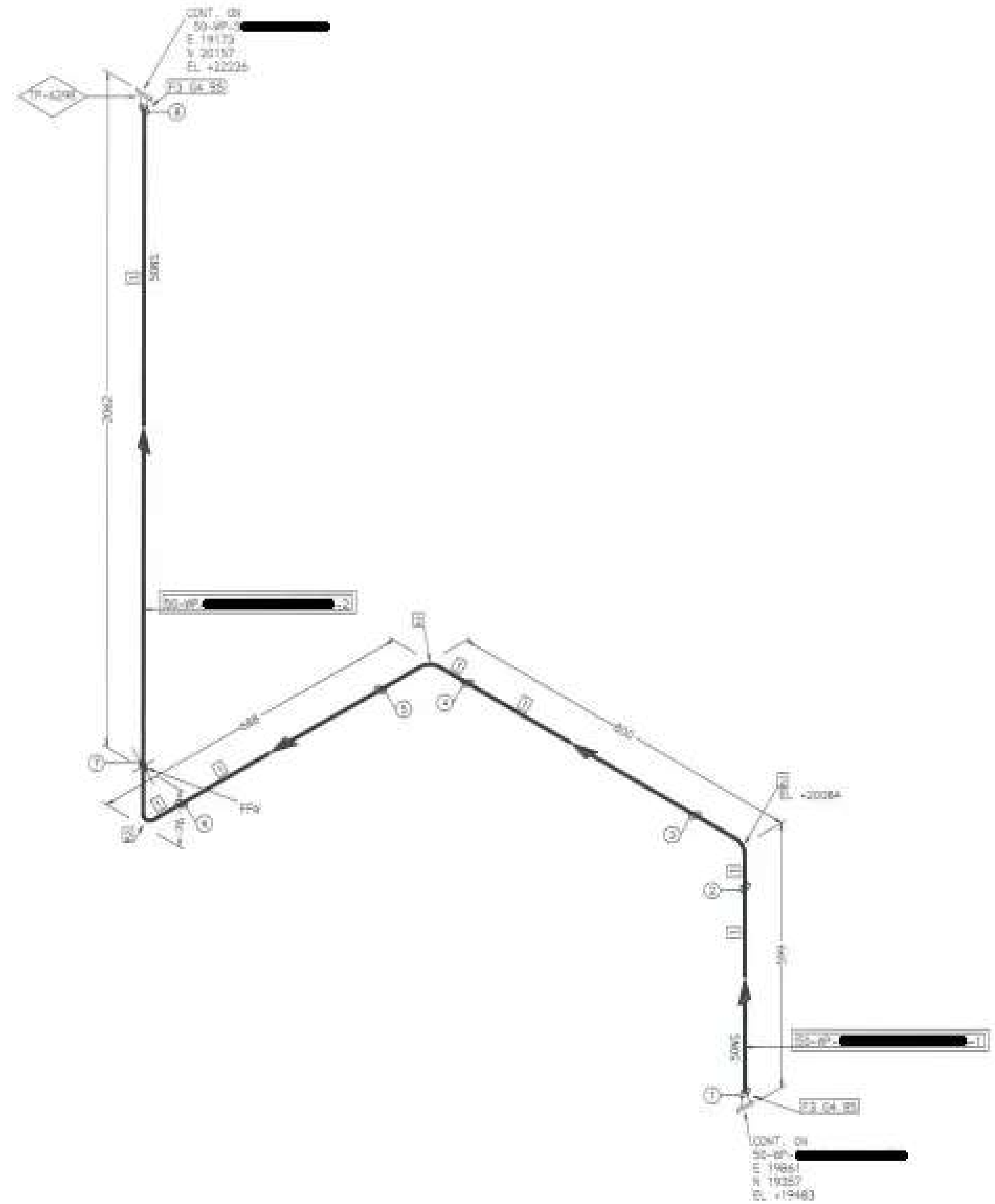
PIPING ISOMETRICS

Every weld that is assembled between spools at the construction site is termed a field weld (FW). There is one more type of weld that is known as field-fit weld (FFW). This FFW is defined by the designer if he/she could foresee that the spool might require some adjustment before the final fit-up, so at the location of FFW that has been marked, it will be given some pipe length tolerance (commonly 150-300mm). Usually, FFW will occur at the nozzle of equipment or tie-in locations.



PIPING ISOMETRICS





PIPING CLASS SHEETS

PIPING CLASS SHEETS

Piping class is an assembly of piping components, suitable for a defined service and design limits, in a piping system. Piping class sheets specify the material and code requirements for designated piping system pressure and temperature ratings.

PIPE CLASS SHEET			
SIZE OF PIPE	2 1/2 INCHES TO 3 INCHES 65mm TO 80mm	3/4 INCHES TO 2 INCHES 20mm TO 50mm	1/4 INCHES TO 1/2 INCHES 8mm AND 15mm
SCHEDULE AND MATERIAL OF PIPE	SCHEDULE 40S SEAMLESS STAINLESS STEEL ASTM A312/A312M GRADE TP304		STAINLESS STEEL SEAMLESS TUBING ASTM A213/A213M GRADE TP304L, FULLY ANNEALED AND SUITABLE FOR BENDING, HARDNESS NOT GREATER THAN ROCKWELL B90 (B80 OR LESS PREFERRED), WALL THICKNESS 0.049 INCH
STOP VALVES	CLASS 150 STAINLESS STEEL ASTM A351/A351M GRADE CF8M BALL OR GLOBE VALVES		CLASS 800 STAINLESS STEEL ASTM A182 GRADE F316/F316L GLOBE VALVES, SOCKET WELDED
		CLASS 800 STAINLESS STEEL ASTM A182/182M GRADE F316/316L GLOBE VALVES AND CLASS 150 BALL VALVES, SOCKET WELDED	
CHECK VALVES	CLASS 150 STAINLESS STEEL ASTM A351/A351M GRADE CF8M SWING CHECK AND SPRING CHECK VALVE.		NOT REQUIRED
		CLASS 800 SOCKET WELDED STAINLESS STEEL ASTM A182/182M GRADE F316/316L SWING CHECK VALVE.	
FITTING	DIRECTIONAL CHANGES SHALL BE SCHEDULE 40S ASTM A312/312M GRADE TP304 5 DIAMETER PIPE BENDS BUTT WELDING. NON-PIPE BEND FITTINGS SHALL BE SCHEDULE 40S ASTM A403/403M GRADE WP304 BUTT WELDING		DIRECTIONAL CHANGES SHALL BE 5 DIAMETER BENDS. OTHER FITTINGS SHALL BE STAINLESS STEEL FLARELESS MECHANICAL GRIP-TYPE. FOR TAPERED THREADS INTO STAINLESS STEEL VALVES OR FITTINGS USE APPROVED THREAD LUBRICANT.
		CLASS 3000 ASTM A182/A182M GRADE F304 SOCKET WELDING	
TYPE OF PIPING JOINT	BUTT WELDING EXCEPT WHERE FLANGED JOINTS ARE SHOWN.		FLARELESS, MECHANICAL GRIP FITTING
		SOCKET WELDING	

PIPING DRAWINGS

Drawings supplied by vendors will vary by manufacturer but generally provide :

- Outline drawings
- Material types
- Parts listing
- Weights and Centres of Gravity
- Field test requirements
- Operating pressures and temperatures and data (e.g. pump curves)
- Start-up, operating, and maintenance procedures

Project Engineering, in addition to its responsibility to review certain documents, shall be responsible for ensuring that the documents are sent to any and all disciplines which need to review vendor documents or need in put from vendor documents.

Project Engineering shall ensure that all disciplines which are required to review the documents, have initialled the documents after review. Each responsible project engineer shall familiarize himself with the requirements of all appendices to this procedure to ensure that all documents are routed to the correct departments.

TECHNICAL REVIEW OF VENDOR DOCUMENTS

Project Engineering, in addition to its responsibility to review certain documents, shall be responsible for ensuring that the documents are sent to any and all disciplines which need to review vendor documents or need in put from vendor documents.

Project Engineering shall ensure that all disciplines which are required to review the documents, have initialled the documents after review. Each responsible project engineer shall familiarize himself with the requirements of all appendices to this procedure to ensure that all documents are routed to the correct departments.

TECHNICAL REVIEW OF VENDOR DOCUMENTS SHALL ENSURE THAT

The vendor design is adequate for its purpose and complies with the latest issue of the Company requisition and the latest issue of the applicable Company documents and authority requirements mentioned therein

- All information which Company requires to complete the work is given (including information required by disciplines not included in the routing)

- Instructions for erection, installation, commissioning, operation and maintenance cover the requirements asset out for these documents and are reviewed by the Specialist Engineer.

INSTRUMENT AND TURBINE DRAWINGS

Design Engineering provides standard set of drawings for the Mechanical Field Engineer to use in the installation process. ThePiping / Mechanical Field Engineer will match the instrument category and service fluid and instruct the craft in which detail should be used. The standard usually will show routing, vents and drains, manifolds, bill of material and stock codes.

DATA SHEET

Data sheet describes technical requirements for the design, manufacturing, assembling, product inspection, installation and testing of mechanical equipment.

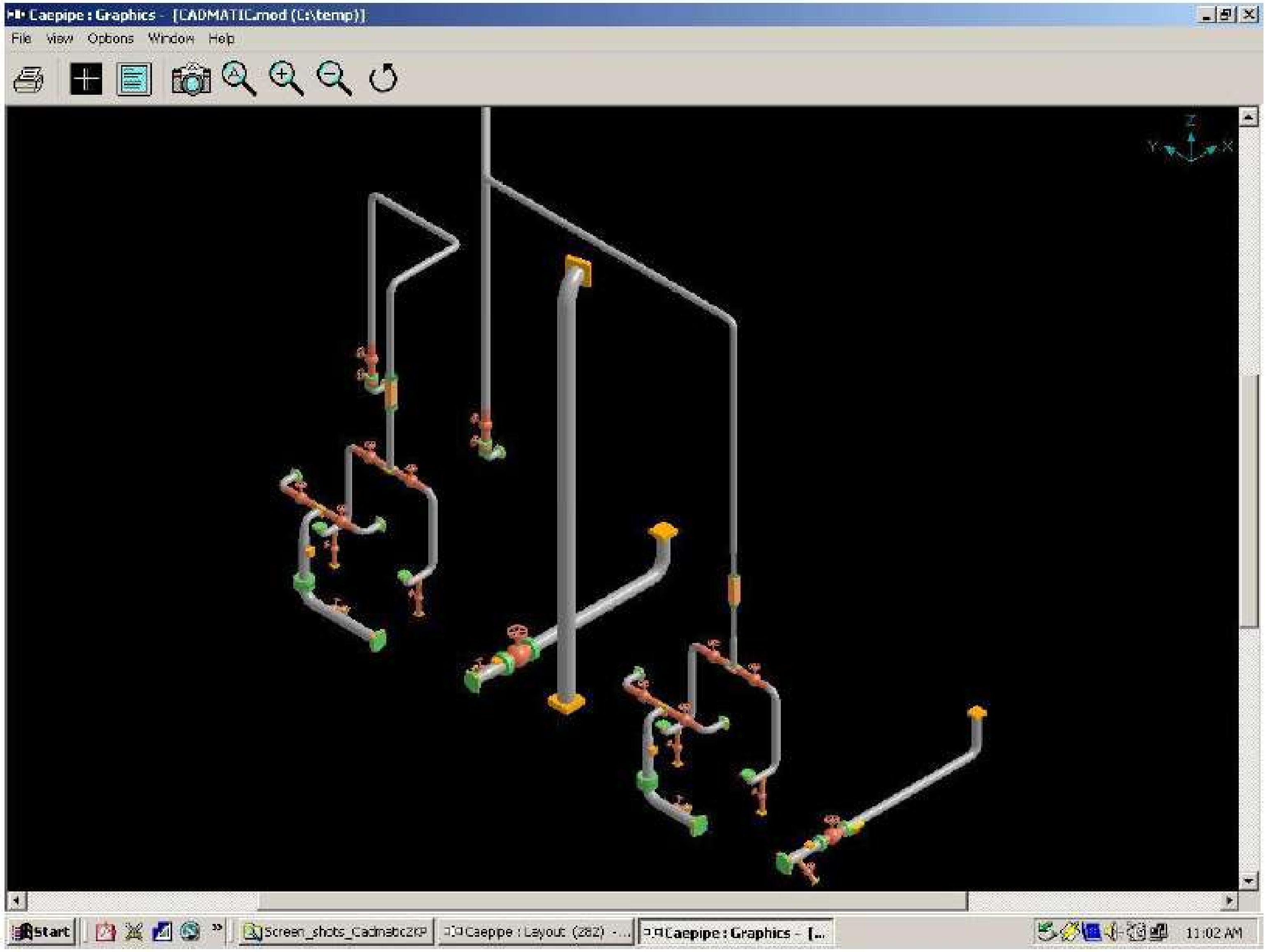
PIPING COMPUTER AIDED DESIGN

Piping sometimes refers to Piping Design, the detailed specification of the physical piping layout with in a process plant or commercial building. In earlier days, this was sometimes called Drafting, Technical drawing, Engineering Drawing and Design but is today commonly performed by Designers who have learned to use automated Computer Aided Drawing / Computer Aided Design (CAD) software as given below.

CAEPIPE is the preferred piping stress analysis program to model and analyze statically and dynamically the effects of weight, temperature, pressure, earthquake, time varying and harmonic loads, among others, on piping systems of any complexity in energy, petrochemical, aerospace, and related industries.
Program also checks for piping code and guideline compliance (ASME, B31, International, API, NEMA).

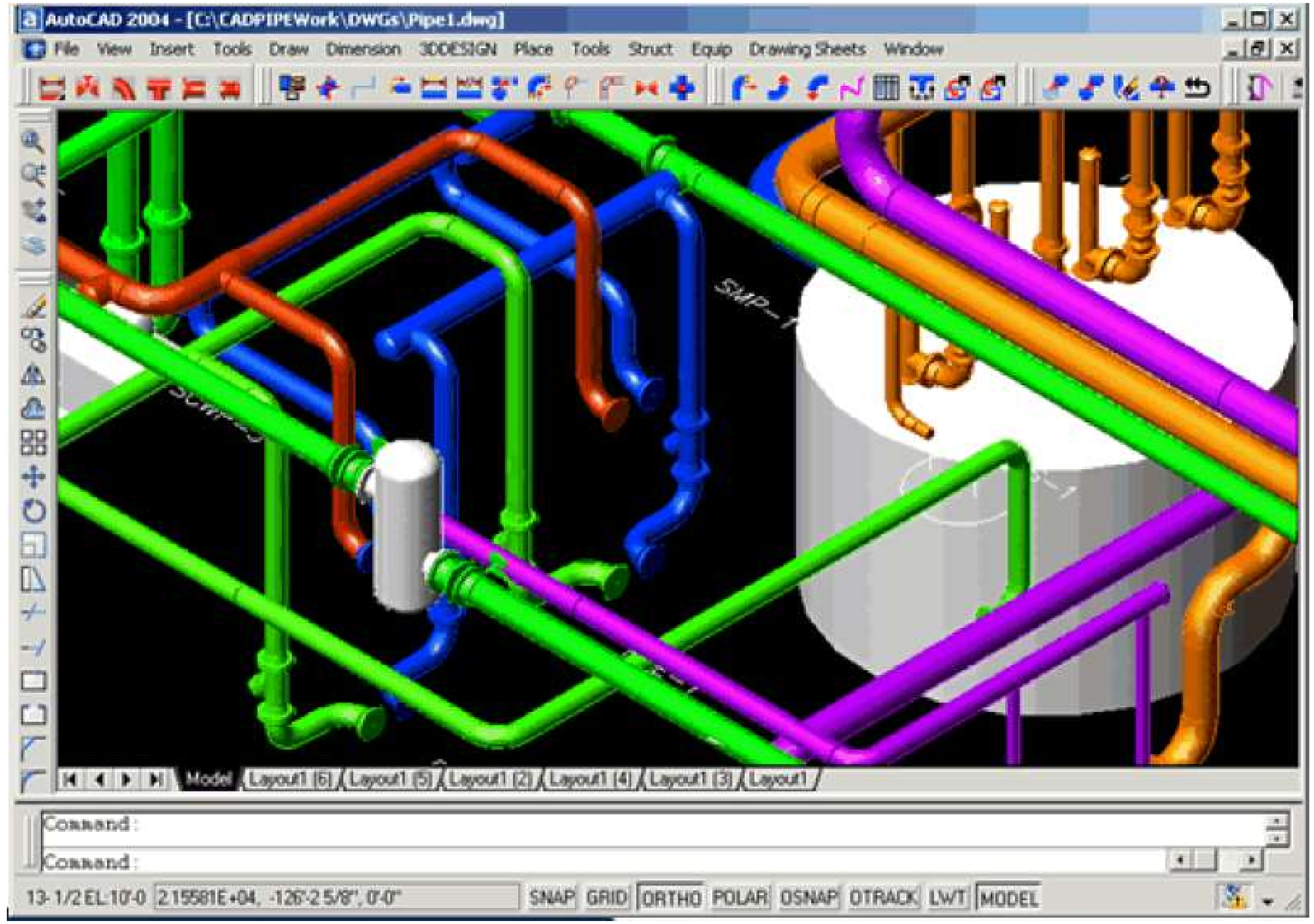
CAEPIPE can import and export data from major plant design systems Piping Computer Aided Design

PIPING COMPUTER AIDED DESIGN



PIPING COMPUTER AIDED DESIGN

Design Group develops and distributes AutoCAD-based software called CADPIPE for the Process Piping, Commercial Piping, HVAC, and steel construction industries



PIPING COMPUTER AIDED DESIGN

AutoPIPE is a native Windows based program working in a 'CAD-Like’ environment in which users can click on the actual pipe model graphics to perform modeling tasks. AutoPIPE combines object-oriented graphics technology with advanced an alytical capabilities not found in other programs to provide a truly unique tool for piping analys is and design. Integration is seamless with all major CAD programs AutoPLANT, PlantSpace, PDS and PDM.

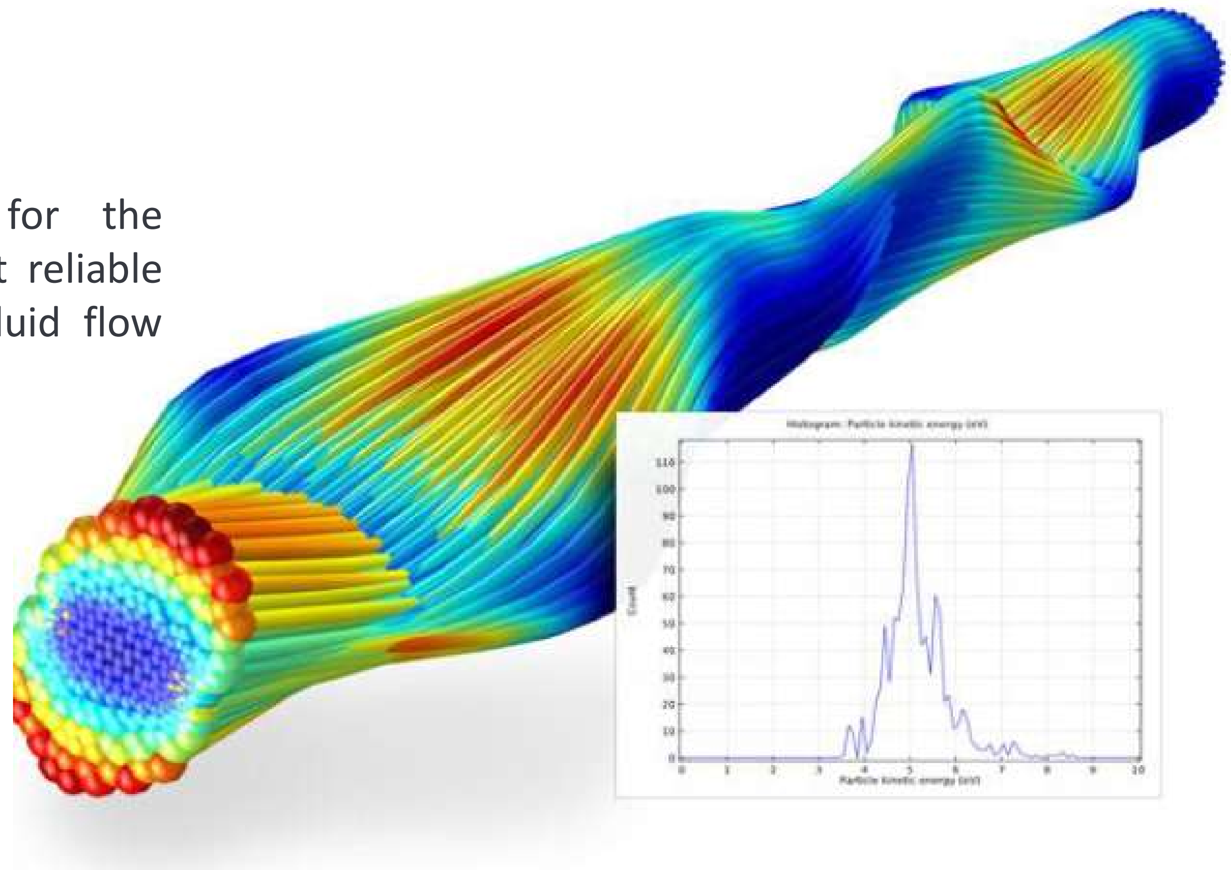
PIPING COMPUTER AIDED DESIGN

Visualisation of FluidFlow

ViziFlow Innovative, low cost software dedicated to fluid flow modeling, stream line and pressure visualization and measurement. Streamlines and pressure distribution can be simulated and measured for pipes and aerofoils.

Design Flow Solutions

Design Flow Solutions is a must for the engineering professional who needs fast reliable reference information or solutions to fluid flow problem.

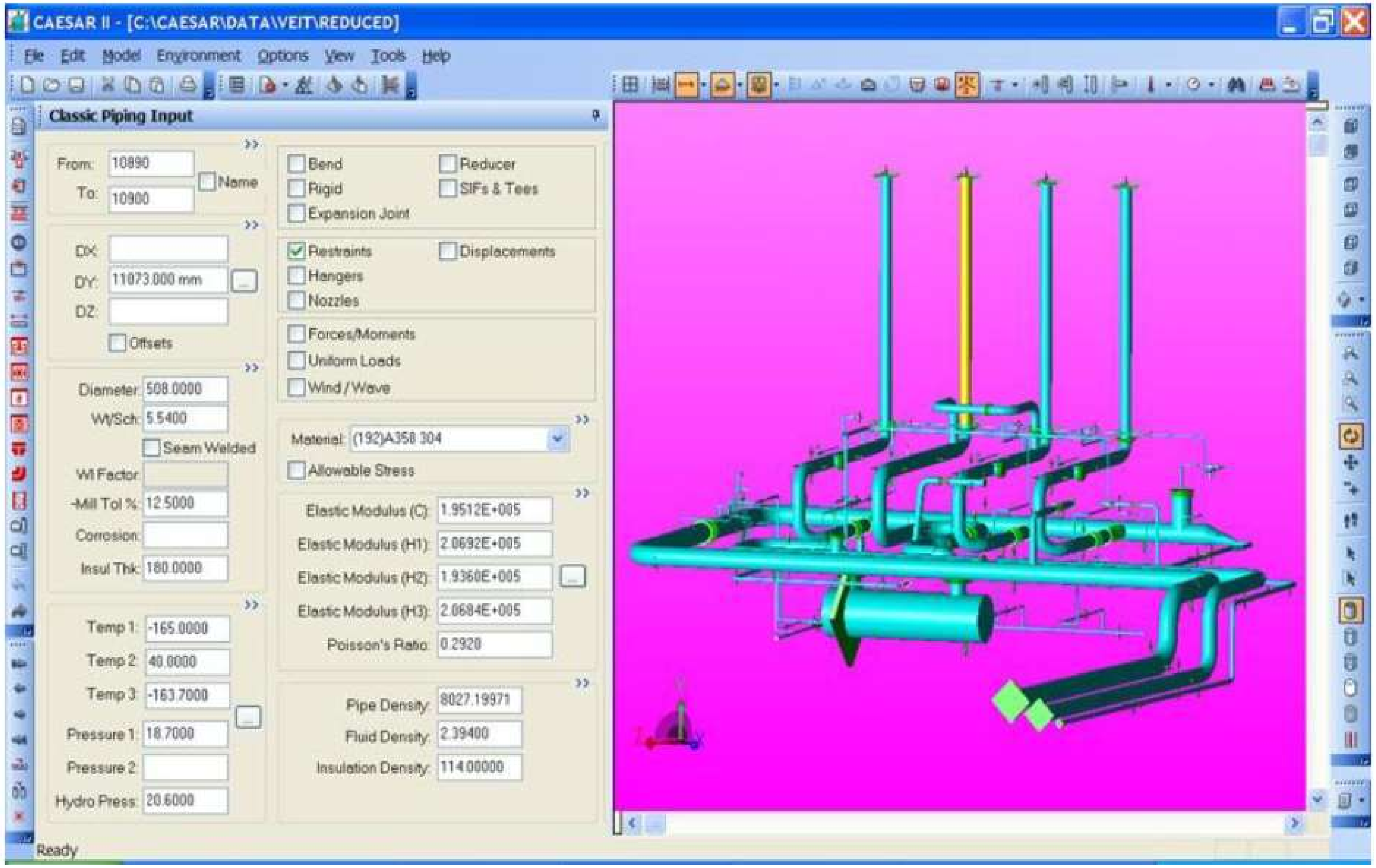


PIPING COMPUTER AIDED DESIGN – CAESAR II

CAESAR II is the Pipe Stress Analysis standard against which all others are measured and compared. The CAESAR II spread sheet in put technique revolutionized the way piping models are built, modified and verified.

CAESAR II was the first pipe stress program specifically designed for the PC environment. The interactive capabilities permit rapid evaluation of both input and output, thereby melding seamlessly into the « design-analyze » iteration cycle.

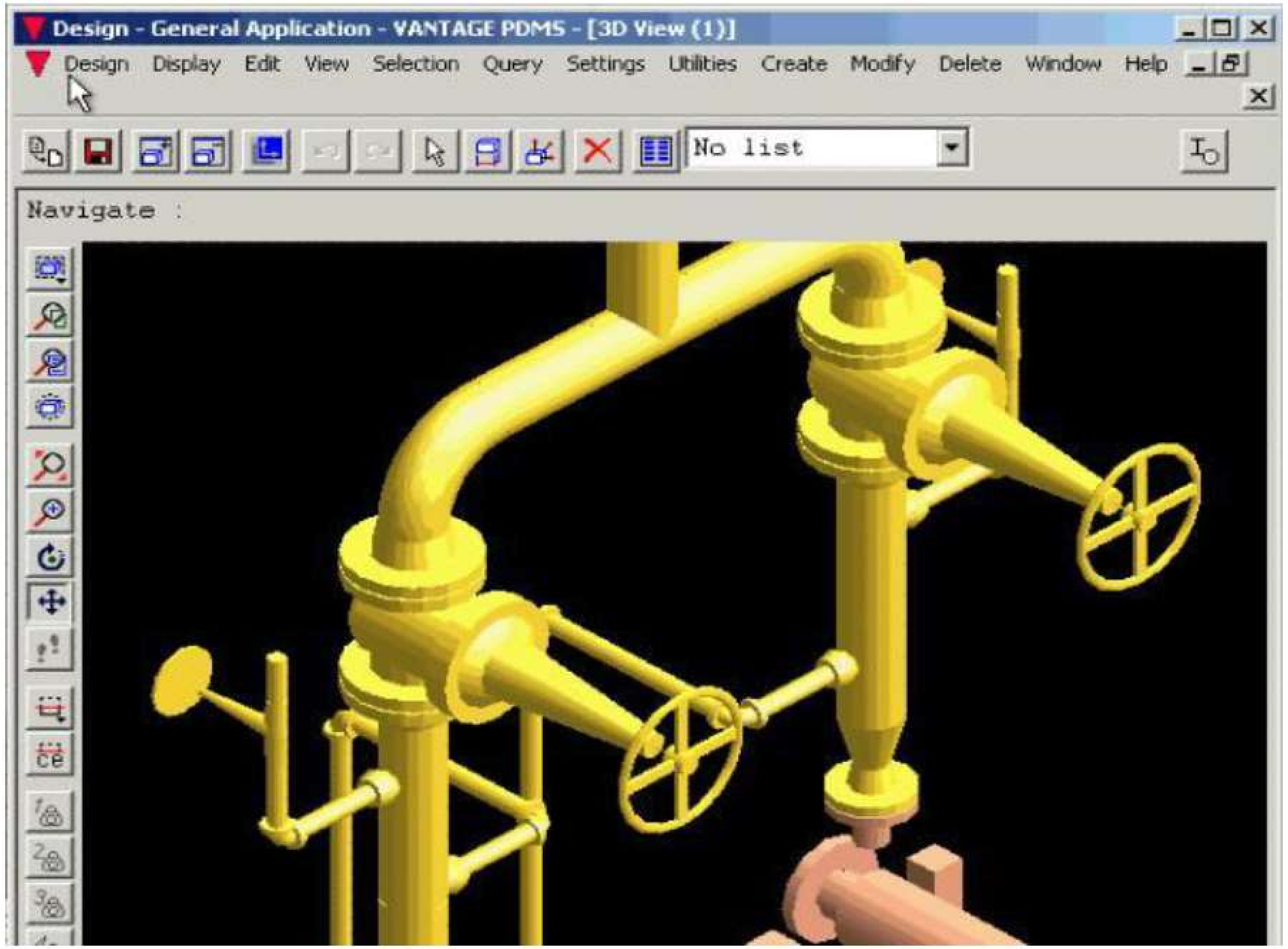
PIPING COMPUTER AIDED DESIGN – CAESAR II



PIPING COMPUTER AIDED DESIGN – PDMS

PDMS (Plant Design Management System)

PDMS as it is known in the 3D CAD industry, is a customizable, multi-user and multidiscipline, engineer controlled design software package fo rengineering, design and construction projects in, but not limited to offshore and onshore oil & gas industry, chemical & process plants, mining, pharmaceutical & food industry, power generation and paper industries.



NEO SUBSEA DESIGN

For your project, if you nedd help, send us a mail to :

neosubseadesign@gmail.com

Or visit our website :

https://neosubseadesign.webador.fr