

Lecture Note

Process Instrumentation Diagrams (PIDs)

Elements of Process Instrumentation Diagrams

- Shows the engineering details of the equipment, instruments, piping, valves and fittings; and their arrangement.
- Referred to as Engineering flow sheet or Line diagram
- P&ID include the following:
- Equipment

The equipment could be the main equipment or miscellaneous equipment. The main equipment include: <u>the vessels</u>, <u>tanks</u> and <u>rotating</u> <u>machines</u>. The miscellaneous equipment include the safety equipment.



Lines with Size Insulation and Materials Typical insulation materials include: polyurethanes and some other polymers.

 The materials for the lines could be any of <u>the steel</u> <u>types</u>, <u>stainless steel</u>, <u>carbon steel</u>, etc.



Control Valve and Instrumentation Loops

Safety Valves

Includes: pressure safety valve and flow down valve.



Diaphragm Valves

Manifold Valves

Source: Instrumentation Process Control, Product Selection Guide, http://www.arthomson.com/Literature/brochures/Instrumentation/parker_product.pdf.



Ball/Plug Valves







MB Series

B Series

SWB Series





Source: Instrumentation Process Control, Product Selection Guide, http://www.arthomson.com/Literature/brochures/Instrumentation/parker_product.pdf.







Bleed and Purge Valve

Relief Valve

Source: Instrumentation Process Control, Product Selection Guide, http://www.arthomson.com/Literature/brochures/Instrumentation/parker_product.pdf.



Pneumatic/Electric Actuators



Source: Instrumentation Process Control, Product Selection Guide, http://www.arthomson.com/Literature/brochures/Instrumentation/parker_product.pdf.

Instrumentation Loops

ABALOLA





- A process engineer with a PID is able to do the following:
 - Construct a plant
 - Start a plant
 - Operate a plant
 - Shut down the plant
- PID should be maintained up to date with rendered drawings.



Likely Questions/Assignment:

- 1. Briefly describe Chemical Process Diagrams
- 2. Outline the purpose of P&ID and list its division
- 3. Give five common P&ID symbols with the instrument abbreviations used in instrument diagram