

AN INTRODUCTION TO PROCESS MEASUREMENTS



Aim of Course

The objective of this five day course is to introduce the student to the measurement principles and the technology incorporated in Electrical, Temperature and Pressure instrumentation utilized in the Process Control of a manufacturing facility. The student is introduced to the measuring instruments, how they operate, how to get correct measurements and be aware of common mistakes and potential sources of error. The course includes some practical work so that on completion the student will be familiar with the measurement principles, technology and the typical measuring instrumentation that may be encountered in the manufacturing facility.

Pre-Requisites for attending this course

There are no pre-requisites for this course however some field experience may make it easier for the student to understand where the process instruments are used in their own manufacturing facility or plant.

Course Overview

Metrology fundamentals

- Accuracy, repeatability and traceability
- Role of NMISA, SABS, SANAS and NRCS
- How to interpret manufactures specifications
- Test Accuracy Ratio and the concept of uncertainty of measurement

Electrical Measurements

- Voltage, Current, Resistance and Ohm's law
- Operation of analog and digital meters
- DC, AC – Average / RMS & Safety Ratings
- Resistance – Series / Parallel
- 2/3/4 wire measurements
- Current shunts and current clamp devices

Temperature Measurements

- Simplified Laws of thermodynamics
- Bi-Metal, Dial and Liquid in Glass thermometers
- Resistance Temperature and Pt-100 Devices
- Simplified Laws of Thermoelectric circuits
- Thermocouple Types and their operation
- Cold junction compensation

Pressure Measurements

- Basic pressure laws – which instruments use which technology
- The typical Manometer and Bourdon tube designs
- Pneumatic, hydraulic systems – differences and applications
- Absolute, Gauge and Differential measurements

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AN INTRODUCTION TO PROCESS MEASUREMENTS (CONT.)



Calibration (Metrology)

- Calibration requirements for different measurement disciplines
- Calibration intervals and general calibration principles
- Accredited services

In all the cases above, there are several practical demonstrations and where possible the students will be exposed to practical exercises in support of the theory discussed during the training.

Who should attend

All persons having an interest in Process Measurement Instrumentation including Instrument apprentices, mechanics and technicians who require a better understanding of process measurements. The course will also be beneficial to experienced plant operators and design engineers for the purpose of continuous professional development (CPD) activities.

Course Duration

5 Days

Evaluation

Daily tests, and the passing of a final examination are required in order to successfully complete this course.

The examination will be written approximately two weeks after the completion of the course.

