

# INSTRUMENTATION & RÉGULATION

PRI



**Duration**  
37 h over 5 days

**Time schedule**  
monday 9 am. - friday 5 pm.

**Skill level**  
Fundamentals ★★☆☆

**Training objective**  
Acquiring new knowledge

**Skills assessment method**  
Questionnaire with open-ended questions

**Number of Attendees**  
Mini : 4 - Maxi : 10

**Instructor in charge**  
Philippe TRICHET

**Main Trainer**  
Philippe TRICHET  
*This training may be run by another instructor*

**Dates & Prix**  
*Look at our web site :  
[www.ira.eu](http://www.ira.eu)*

**Formation disponible en INTRA à la demande.**

## Infos complémentaires

**Senior training instructor, recognised as an expert in his field.**

**By the end of the session, a training certificate is delivered with an assessment of acquired skills.**

**Meals are included.**

**Hands-on Training**



## Practice of Instrumentation

*This course enables English-speaking operation or maintenance staff of industrial installations to discover and implement the various technologies for measuring pressure, level, flow and temperature, as well as the technology of control valves and their positioners. It sheds light on the causes of malfunctioning of these instruments and on the influencing factors that can distort measurements.*

### Learning objectives :

- Attendees will acquire the base theory of operation of measuring instruments, control valves, and positioners.
- They will learn how to install, wire, set, tune, maintain and troubleshoot them.

### Who should attend ?

Operations and Maintenance Technicians and Engineers, who are new to instrumentation, or who wish to be "cross trained".

### Ways and Means :

- The course provides valuable information via lectures on theoretical concepts, backed-up by direct hands-on training in fully equipped classrooms.
- More than 50 % of the time is dedicated to actually working on various industrial instruments installed on test benches.
- A knowledge assessment test followed by its proofreading will be run at the end of the training.

### Prerequisites :

- Knowledge of basic mathematical concepts and physical laws, although not required, would be helpful.

## Course content :

### INTRODUCTION

- Structure of a basic feedback control loop.
- P&ID's drawing standards.
- Basic electricity, 4 - 20 mA loop.

### PRESSURE, LEVEL, FLOW & TEMPERATURE MEASUREMENT

- Pressure : Concept, different pressure types, units, sensors, analog electronic and smart transmitters, installation and calibration, pressure switch.
- Level : Indicator, hydrostatic head, capacitive, ultrasonic, nuclear, radar, float, buoyancy, resistive, mechanical type, vibrating blades, rotating paddle.
- Flow : Differential pressure, rotameter, electromagnetic, ultrasonic, turbine, vortex, rotary, Coriolis, thermal, flow indicator and switch.
- Temperature : Thermocouple, resistance temperature detector (RTD), infrared radiation pyrometer.

### CONTROL VALVES

- Theory of operation, bodies, trim, actuators, flow characteristics, sizing, cavitation, shutoff pressure, leak tightness, calibration.
- Different valve types.
- Control valve positioners.

### HANDS - ON TRAINING (50 %)

- Installing, wiring, setting, checking and troubleshooting various industrial measuring instruments, control valves and positioners.
- Designing and building a complete feedback control loop.

## NOTE

*This training course is part of a two module training package called «PIPC» : Practice of Instrumentation and Process Control, (PPC p. 35 + PRI p. 34).*