

FLOW CONTROL BENCH - LEVEL - PRESSURE - TEMPERATURE

REFERENCE : MP111



Non contractual photo

SERVICE : 7 KW - 380 V TRI - 50 HZ
COMPRESSED AIR: 6NL / H, 4 BARS (NOT SUPPLIED) COMPUTER FOR USING THE SOFTWARE
DIMENSIONS : 1500 X 800 X 2100 MM

WEIGHT : ~150KG

The bench allows the implementation of several regulations. 5 processes are possible :

- 1. Level control** Actuator: Pneumatic valve Sensor: Water pressure transmitter Disturbance: Leakage on the pipe, leakage under the column.
- 2. Flow control** Actuator: Pneumatic valve Sensor: Pallet flow meter Disturbance: Leakage on the pipeline.
- 3. Pressure regulation** Actuator: Pneumatic valve Sensor: Pressure transmitter Disturbance: Leakage on the pipeline.
- 4. Temperature control** Actuator: immersion heater Sensor: tank temperature sensor Disturbance: cold water supply.
- 5. Cascade temperature / flow control** Actuator: pneumatic valve Sensor: temperature probe at the heater outlet and pallet flow meter Disturbance: leakage on the pipe, variation of the heating power.

The bench consists of a common module (feed tank, pump, electrical box) and a specific instrumentation specific to each loop to be studied (actuator, pneumatic valve, static power unit and measurement, differential pressure sensor, Pt100 probes, vane flowmeter). The student will be able to choose his loop by multiposition switch and measure the inputs / outputs of the regulators.

Educational Objectives :

- Level regulation (first order process + integrating process)
- Pressure regulation (1st order process)
- Temperature regulation (1st order process)
- Flow regulation (1st order process)
- Cascade regulation: temperature / flow
- Temperature regulation in all or nothing
- Study of the static response
- Open Loop and Closed Loop Identification
- Calibration of a level sensor

Technical specifications :

- A 50-liter feed tank, with racking and overflows placed at two different levels
- A stainless steel coil for heating water in the tank
- Column in altuglas, with overflow, graduations, draining and racking
- Centrifugal pump, 380 V three-phase
- A master controller with universal input, 4-20 mA output and a slave controller - Control algorithms P, PI, PID, PD +
- MR; Auto / manual function - self-adaptive; Triple measurement / output / setpoint display - Both Ascon brand controllers have RS485 communication cards
- An additional temperature controller
- Pneumatic proportional valve
- A P / I converter
- A pressure sensor (4-20 mA output)
- Pallet flow meter (4-20 mA output)

- Four float flowmeters
- A pressure sensor (4-20 mA output) placed at the bottom of the water column
- An immersion heater with thermostat
- Two temperature sensors
- An electrical box including the regulators, the protection of the pump and its control.
- A multiposition switch to choose the assignment of the inputs / outputs of the regulators according to the loop to study the thermostat, the static power unit, the converters, the sensor power supplies
- Recovery of the input / output of each regulator on secure double-well terminals

OPTIONS :

MAC 2 acquisition module composed of: - an RS485 / RS232 converter - a Windows operating system that allows: reading the PID parameters, the plot of the curves, the configuration of the remote controller, archiving values.