PUMPING SYSTEMS WITH SUPERVISION AND REGULATION

These 4 versions of pumping systems are supplied wired and configured. According to the model selected, the student can study supervision, level regulation and flow rate regulation. System supplied fully functional with examples of programming.

A CD contains the user instructions, tutorials and the controller (PLC), HMI and speed variator programs.

Supervision enables viewing of:
- The water level in each tank
- Detection and the state of each all or nothing sensor
- Pump operation
- The tank level messages
- The control of the speed variators (as per reference)
- The signals 4-20mA of the analogue sensors (as per reference)
- Observation of the total operation of the pumping station

Supervision enables control of:
- Switching the system on/off
- Switching the motor pumps on/off
- Starting in manual mode
- Starting in automatic mode
- Maintenance mode
- Interacting on the total operation of the pumping station

ref. HYDRO-1-C	Communicating models Tablet & Smartphone
ref. HYDRO-2-C	
ref. HYDRO-3-C	
ref. HYDRO-4-C	

NEW

STANDARDS MODELS : 3-PHASE 400V
Available on single-phase 230V
Add -230 at the end of the references

Manual + Practical works

EDUCATIONAL OBJECTIVES	HYDRO-1	HYDRO-2	HYDRO-3	HYDRO-4
Study of the supervision of an industrial pumping station	✔	✔	✔	✔
Study of the regulation of water level by all-or-nothing float sensor	✔	✔	✔	✔
Study of the regulation of water level by hydrostatic sensor 4-20mA	✔	✔		
Study of the regulation of water flow rate by flowmeter 4-20mA	✔		✔	
To understand the operation of an industrial pumping system	✔	✔	✔	✔
To take industrial measurements of electrical values	✔	✔	✔	✔
To produce a PID program with a controller PLC	✔	✔	✔	
To study Ethernet / IP addressing	✔	✔	✔	✔
To learn how to use and configure a speed variator	✔	✔	✔	
To perform industrial maintenance operations	✔	✔	✔	✔
To study the analogue signal 4-20mA	✔	✔	✔	

PRACTICAL WORKS	HYDRO-1	HYDRO-2	HYDRO-3	HYDRO-4
Study and identification of the components of a pumping station	✔	✔	✔	✔
Measurement of the voltages, currents, and powers of the motor pumps	✔	✔	✔	✔
Configuration of the speed capacitor according to the pump	✔	✔	✔	
Configuration of the IP addresses of the PLC, the screen and a computer	✔	✔	✔	✔
Production of automation programs	✔	✔	✔	✔
Production of HMI programs	✔	✔	✔	✔
Performance of industrial maintenance operations	✔	✔	✔	✔
Measurements of an analogue signal 4-20mA and 0-10V	✔	✔	✔	
Production of regulation supervision with all-or-nothig sensors	✔	✔	✔	✔
Production of level regulation supervision with the controller (PLC) of the PID	✔	✔		
Production of regulation supervision of flow rate with PID regulation	✔		✔	

COMPONENTS	HYDRO-1	HYDRO-2	HYDRO-3	HYDRO-4
Aluminium frame with casters	✔	✔	✔	✔
1 bottom tank of 150L	✔	✔	✔	✔

2 top tanks (transparent sides) each with:
   3 float level sensors,
   1 multiple turn draining valve.
   1 overflow safety system.
	✔	✔	✔	✔

2 three-phase motor pumps 230/400V (1hp). Safety device for no load pumping and reversal of rotation direction. Equipped with 2 multiple turn valves.	✔	✔	✔	✔
1 electrical cabinet with residual current and thermal-magnetic protective devices	✔	✔	✔	✔
1 Schneider® controller M221(PLC) with integrated PID and analogue board	✔	✔	✔	✔
1 Ethernet colour touch screen 5.7". Attached to a rotating arm. The screen can be removed easily for easy storage	✔	✔	✔	✔
1 Vijeo Designer® supervision program	✔	✔	✔	✔
1 three-phase speed variator with its programming software Somove® (configured for level regulation)	✔	✔		
1 three-phase speed variator with its programming software Somove® (configured for flow rate regulation)	✔		✔	
1 water level sensor 4-20mA – Configured for water height of 600mm	✔	✔		
1 flowmeter 4-20mA – Display and programming buttons on front	✔		✔	
1 PID regulator with screen and programming buttons on front.	✔		✔	

OPERATING PART ALONE

ref. HYDRO-OP

- 1 aluminium frame with casters
- 1 bottom tank of 150L
- 2 top tanks (transparent sides) each with :
      3 float level sensors
      1 multiple turn draining valve
      1 overflow safety system
- 2 three-phase motor pumps 230/400V (1hp).
   Safety device for no load pumping and reversal of rotation direction.
   Equipped with 2 multiple turn valves.
- 1 console equipped with 2 Harting® industrial connectors
   grouping the wiring of the motor pumps and all-or-nothing level sensors

OPTIONS FOR PUMPING SYSTEMS

FLOWMETER (INCLUDING ON HYDRO-1 AND HYDRO-3)

ref. HYDRO-DEB

This option is driven by the controller (PLC) and the supervision software.
It allows to display the real flow according the position of one of the valves.
The controller (PLC) processes the signal 4-20mA for an easy supervision.

HYDROSTATIC PRESSURE SENSOR

This option, supported by the PLC and the monitoring program, measures the water level. The monitoring screen displays the levels in the tanks proportionally to the pressure. Possibility to install 2 sensors, one on each tank (Basin / Water tower).
• Piezoelectric measuring cell
• Scale precision +/- 0.5%
• 4-20 mA

ref. HYDRO-NIV

INCLUDING ON HYDRO-1 AND HYDRO-2

ALL OR NOTHING FLOW SENSOR
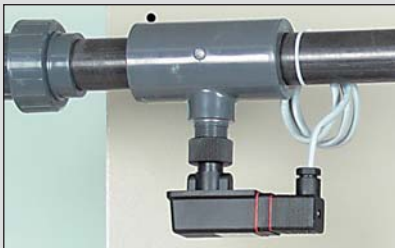
ref. CO-DEB

Detects water flowing in the PVC pipe of the circuit. An NO or NC contact at the sensor output sends information to a PLC or a contactor.
Features
• Can be fitted in any position
• PVC connection Diam: 40mm to be stuck on
• Switchable, potential-free contact
• NO or NC 1A/230VAC
• Electrical connection via a DIN connector

FLOW INDICATOR WITH FLOAT

A moving float in a transparent tube indicates the pump's water flowrate in cubic meter/hour
Features
- Upright fitting
- Measuring scale: 0.6 to 6 cubic meter/hour
- Ascending fluid
- Float and stop
- PVC connection Diam: 40mm (to be stuck on)

ref. FLO-DEB