

Drinking water supply simulator (VijeoDesigner-Schneider®)

SYSTEM DESCRIPTION

- 1 150-litre tank simulates the river.
- 2 transparent tank (60 L) simulates the settling basin and the water tower
Fitted with 3 water-level sensor (all or nothing).
- 2 motorised pumps draws the water (river to the basin / basin to the water tower)
- 1 tap drains the water tower.
- 2 all or nothing flow sensors.
- 1 valve drains the settling basin.
- 2 valves at the motorised pump output to adjust the flowrate of the water.
- 2 emergency overflows.
- 1 test cabinet, with PLC, Analog card and Ethernet...
- Protection main control panel with circuit breakers including one 30mA control and consignment.

THE MONITORING ENABLES TO DISPLAY

- The water-levels
- The settling basin pump feed
- The water tower pump feed
- Movement of the water from the river into the settling basin
- Movement of the water in the settling basin to the water tower
- Low water level warning message for each tank

THE MONITORING ENABLES TO CONTROL

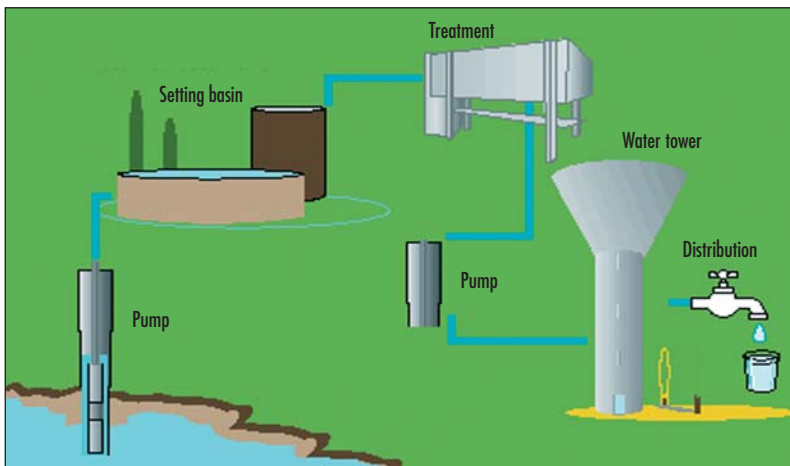
- the settling basin pump feed manually
- the water tower pump feed manually
- the cycle start
- MANUAL / AUTOMATIC / MAINTENANCE mode

THE MONITORING ENABLES TO SIMULATE

- the detection of the 6 water level sensors

Features of the PLC supplied

- sequential function chart or ladder language programming
- 230V mains power supply.
- 14 inputs 24V DC on terminal
- 10 binary outputs 230V/2A on terminal
- RJ45 Ethernet output, used for connecting the PLC to the IP computer network.
- The programming software and index in the form of ladder language is supplied.



The water that comes out of our taps is drinkable and has travelled a long way. In some cases, it is pumped from rivers and then undergoes various treatment processes before it becomes fit for drinking. It flows into a settling basin, at the bottom of which the heaviest materials are deposited, then it is filtered through layers of sand and sterilised, in order to remove bacteria. This clean water is then transported by means of pipes and pumping before it is stored in a water tower. These provide consumers with a constant pressure. The CHATO system enables students to simulate this entire circuit, from the stage where water is pumped from rivers to the stage where it arrives in people's homes.

TRANSPARENT TANKS MADE FROM UNBREAKABLE LEXAN



System characteristics

- Frame on wheels.
- Dim 1500 x 750 x 1970mm.
- Weight : 190kg.

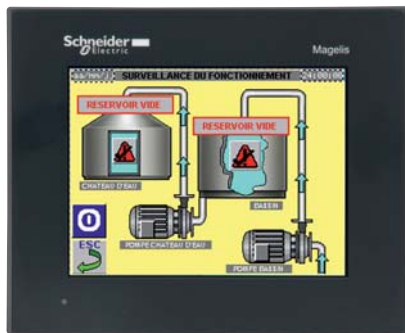
EDUCATIONAL OBJECTIVES

- Understanding, putting into service, getting started and setting of the system
- Understanding the settings and the programming of the PLC
- Know more about the monitoring application

USER'S MANUAL + MONITORING PW

Proposed Practical Works

- Setting of the PLC
- IP addressing management
- Loading, modification, monitoring creation



MONITORING ON TOUCHSCREEN

REF. CHATO-4S-T6

PLC programming software
Monitoring software VijeoDesigner
5.7 inch colour touchscreen

The monitoring software delivered with the set allows to modify the initial program and to create your own programming.



MONITORING ON PC ONLY

REF. CHATO-4S

PLC programming software
Monitoring software VijeoDesigner

The system is the same than in the version above but without the touch screen. The monitoring is made on PC with the software SCHNEIDER VijeoDesigner.

FEATURES OF THE DIFFERENT COMPONENTS

PUMPS & FLOW CONTROL VALVES



- 2 PUMPS
- 230/400V 3-phase motor (SINGLE-PHASE UPON REQUEST)
 - Power 750W
 - Stainless-steel body and turbine
 - Auto-start

FLOW CONTROL VALVES

- 1 for setting tank pump
- 1 for water-tower pump

SENSORS



- Dry-contact horizontal level sensors.
- max voltage 24V
- Max current 3A

ALL OR NOTHING FLOW SENSOR



Detects water flowing in the PVC pipe of the CHATO circuit. An NO or NC contact at the sensor output sends information to a PLC or a contactor.

DRAIN VALVES



Used to drain the tank, e.g. to simulate reservoir maintenance.

TAP



Simulates domestic water consumption. Connected by hoses to the tank that simulates the river.

150L TANK



- Simulate the river.
- Plastic tank with drain plug.
- Installed on a base so it can be moved with the system.

OPTION FLOWMETER



The sensor shows the flowrate of the water on the display unit when it leaves the pump. Students can observe a change in the flowrate, depending on the valve setting. 4-20mA signal output on Ø4mm safety terminals.

ref. CHATO-DEBIT

HYDROSTATIC PRESSURE SENSOR OPTION



ref. CHATO-NIV

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

Drinking water supply simulator with electrical cabinet (not wired)

Version without monitoring

TRANSPARENT TANKS MADE FROM UNBREAKABLE LEXAN



ref. CHATO-4-GD

Open solution to traditional cabling solution in electrical engineering wiring.

- Door panel prewired
- Free spaces for adding some control components (Diam 22mm)
- The grid is easy to disconnect due to Harting connectors and plugs for the level sensors, the moto- pumps and the power supplies 400V and 24V.

SYSTEM DESCRIPTION

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Fitted with 3 water-level sensor (all or nothing).
- 2 motorised pumps draws the water
(river to the basin / basin to the water tower)
- 1 tap drains the water tower.
- 2 All or nothing flow sensors.
- 1 valve drains the settling basin.
- 2 valves at the motorised pump output to adjust the flowrate of the water.
- 2 emergency overflows.
- 750 x 1500mm base on wheels enables you to move the system
- 1 test cabinet not wired.
- 1 electric console with control and protection.

EDUCATIONAL OBJECTIVES

- Understanding, putting into service, getting started & setting of the system
- Wiring of different components and connection

USER'S MANUAL + PW

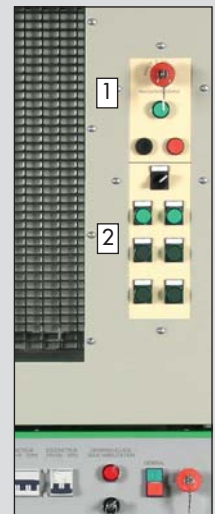
Proposed Practical Works

- Wiring of electrical components according the different operating modes
- Troubleshooting and maintenance

DOOR OF THE CABINET OPENED



DOOR CLOSED



TECHNICAL FEATURES OF THE CABINET

800 x 600 x 250mm steel cabinet, supplied with a grid.

- 1 Plate on door with unwired control lamps and actuators.
- 2 Free spaces for the addition of DIAM 22 control components
- 3 Rapid connection and hanging of the grid (not exceeding 750 x 750mm).
- 4 Door safety contact
- 5 Fixed connectors on grid, to be wired by students
- 6 Male Harting® connectors to level sensors, to motorised pumps, to the 400 and 24V power sources and to the control panel.

TECHNICAL FEATURES OF THE CONSOLE

Console which makes testing safe, with control of the cabinet door's safety contact.

- A** Circuit breaker, in front of the power source
- B** General residual current circuit breaker 30mA.
- C** General emergency stop and Start/Stop
- D** 2 circuit breakers for protecting the three-phase and 24V power supply

E DOOR OVERRIDE

*Key-operated door override switch. Allows the live cabinet to be used with the door open if the switch has been activated.
Operates with a different key to the No.455.*



Drinking water supply simulator (operative part only)



SYSTEM DESCRIPTION

- 1 150-litre tank simulates the river.
- 2 transparent tanks (60L) simulates the settling basin and the water tower. Fitted with 3 water-level sensors (All or Nothing).
- 1 moto-pump draws the water from the "river" to the "basin".
- 1 moto-pump draws the water from the "river" to the "water tower".
- 1 tap simulates the water consumption. The water flows from the "water tower" to the "river".
- 1 valve drains the settling basin. Flow rates are adjusted by 2 valves at the output of moto-pumps.
- 2 safety overflows devices on the upper parts of tanks avoid any overflow.
- 1 set of 2 cables (3m) equipped with female Harting connector can connect the operative part on your connection box of a control unit.
- 750 x 1500mm base on wheels enables you to move the system easily.
- 1 mimic console + quick connection interface.

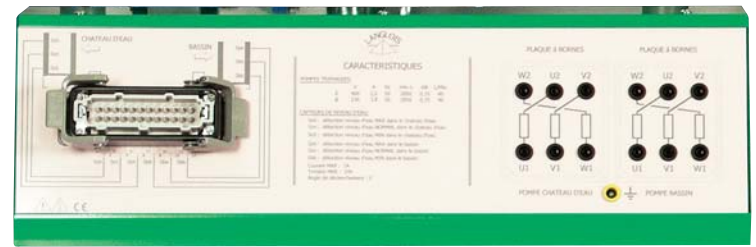
MIMIC CONSOLE

All the connections and measuring are made on this user-friendly mimic console.

- 1 male HARTING connector on the left section is connected to the 6 water level sensors.
- A synoptic indicates the function of each connection and the main features of the system.
- 12 safety terminals and 1 earth socket (4mm) are connected to the electrical windings of the moto-pumps. The student is able to measure the currents with a multimer.

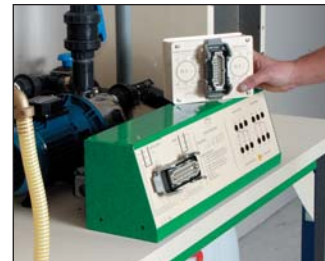
CONNECTION BY SAFETY SOCKETS OR BY MEANS OF THE QUICK CONNECTION INTERFACE

- A quick connection interface (4mm terminals / male Harting) is plugged on 13 connection sockets for the connection to a control cabinet (not supplied). A detailed synoptic on the interface shows the function of each connection.



RAPID CONNECTION INTERFACE FOR THE PUMPS

This unit is plugged directly into the mimic console, transforming the 12 safety terminals 4mm into a HARTING ® industrial rapid connector



SET OF 2 CABLES



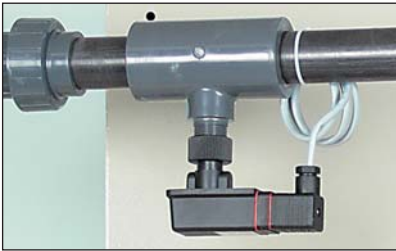
Set of 2 3-metre-long cables supplied with CHATO.

- 1 interconnection cable for sensors
- 1 interconnection cable for motors



Options for drinking water supply simulator CHATO-4 & CHATO

ALL OR NOTHING FLOW SENSOR



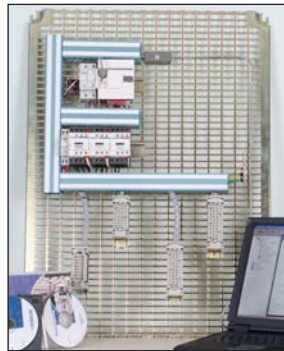
ref. CO-DEB

Detects water flowing in the PVC pipe of the CHATO 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

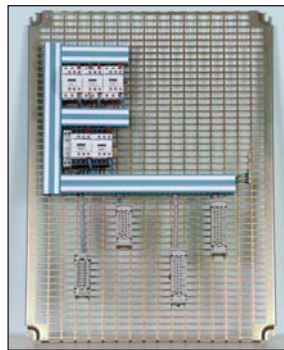
GRID & PLATE FOR PLCs



Wired door plate and grid for system operation with a PLC. Supplied with programming and training software.

ref. CHATO-AUTO

GRID & PLATE FOR RELAY



Wired door plate and grid for system operation with relay.

ref. CHATO-REL

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

FAULT SIMULATOR UNIT



Unit with concealed switches to simulate sensor faults. 6 switches linked to 6 sensors. Unit fixed onto the system's frame.

ref. CHATO-PAN

SUMMARY AND HELP IN THE SELECTION OF THE DIFFERENT CHATO SYSTEM PRESENTED PAGES 164 TO 167

Ref. CHATO-4S-T6



Simulator with electrical cabinet and monitoring on touchscreen

Ref. CHATO-4S



Simulator with electrical cabinet and monitoring on PC only

Ref. CHATO-4-GD



Simulator with electrical cabinet

Ref. CHATO



Operative part only