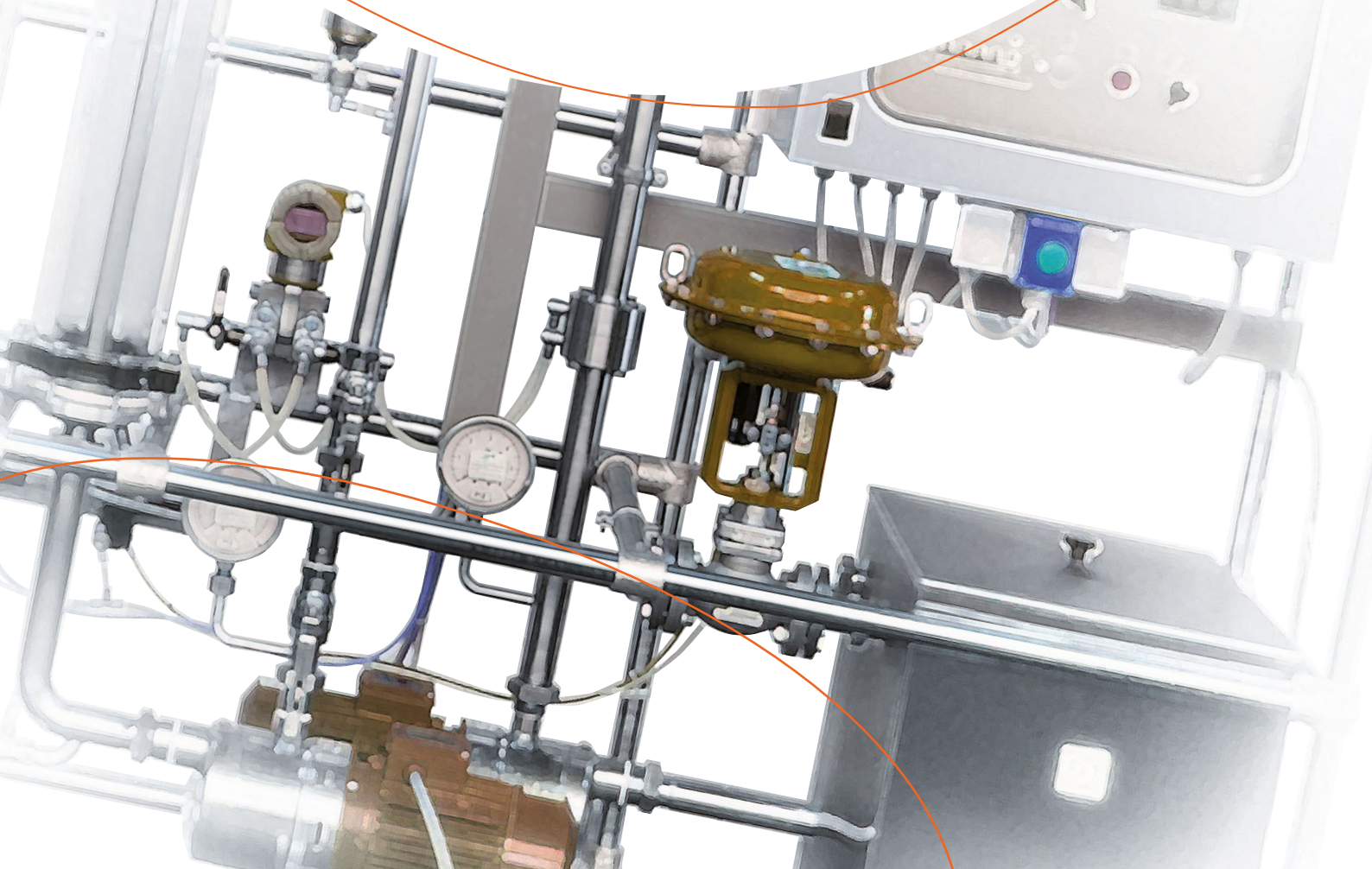
ElettronicaVeneta

CATALOGUE No. 25-C

INDUSTRIAL PROCESS CONTROL



ElettronicaVeneta

CATALOGUE No. 25-C

INDUSTRIAL PROCESS CONTROL

Industrial process control

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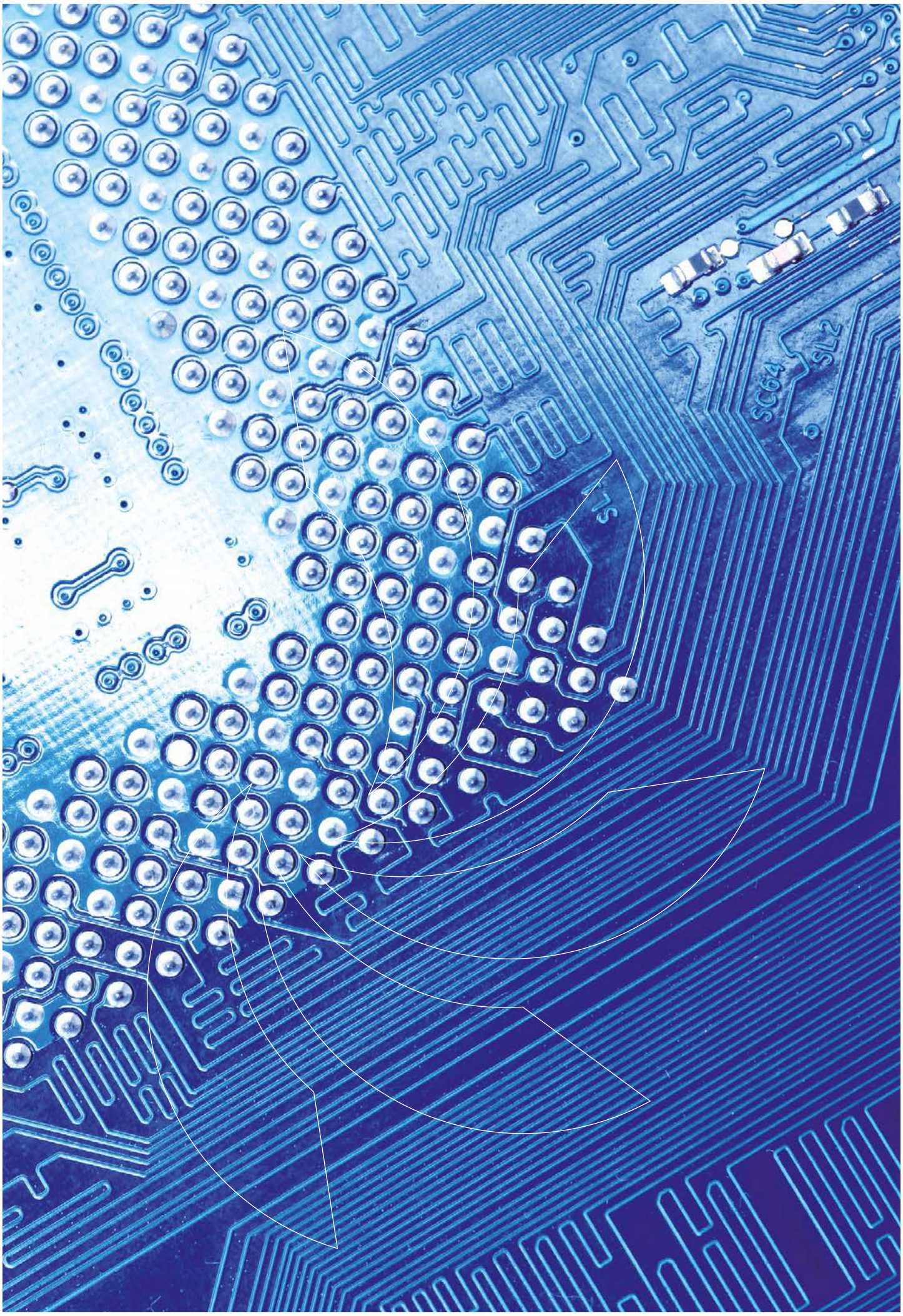
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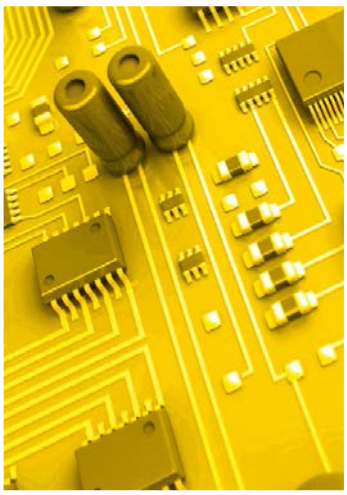
INDUSTRIAL PROCESS CONTROL
CATALOGUE No. 25-C

INDEX

Note: The catalog is constantly updated. Please send any suggestion you have to export@elettronicaveneta.com. We would also like to remind you that, due to the continuous technological upgrades, the described products may be subjected to design and/or technical modifications. Nevertheless, we guarantee that the educational content of our equipment remains unchanged.

GENERAL INTRODUCTION



ELETTRONICA VENETA S.p.A. has been designing and manufacturing educational equipment since 1963. This equipment, covering the different fields of technology, fulfils two important educational objectives:

- to facilitate the learning process of the student by means of real systems which illustrate practically the important aspects of the theory learned in the classroom.
- to simplify the work of the teacher enabling the demonstration of the real, practical applications of the theory learned.

Increasing the efficiency of the didactic process improves and simplifies the integration of young students into the world of employment and justifies the material and human investments made in schools throughout the world.

ELETTRONICA VENETA S.p.A. operates on an international level and takes into consideration the training programmes and cultures of each specific country. In order to meet different requirements, we offer flexible systems which ensure maximum compliance with the latest technologies, technological advances and the professional profile requirements of local industry.

The proposed laboratories and training equipment are suitable for regular school education as well as ongoing post-diploma training courses and professional re-qualification.

Our training equipment covers most of the technological sectors included in the training programmes of vocational schools, technical institutes and universities, both national and international.

ELETTRONICA VENETA S.p.A. headquarters is located in the green fields of the Veneto region, not far from Venice, and constitute a centre for equipment design and development suited to the training needs of all professional and technical profiles. The modern premises integrates R&D laboratories, a production plant and a fully equipped teacher training centre.

The integration of these efficient training systems into local school structures ensures high-quality, state-of-the-art training programmes which meet the diverse professional expectations of the student and the technological requirements of industry and research within their specific local contexts.

The ISO 9001 (Quality System Certification) obtained in 1998 and updated in application of the latest edition of the International Standard, is further testament to the quality-driven organisation of **ELETTRONICA VENETA S.p.A.** aimed at providing top standard equipment, training and service.

PRESENTATION

A chemical plant mainly consists of a set of equipment that carry out chemical and physical transformations of raw materials to obtain the desired end product.

It is easy to realize how complex it is to control and coordinate what happens in every section of the plant so that the resulting product complies with the necessary specifications and operating costs are acceptable.
Actually, this corresponds to keep a lot of process variables, such as temperature, pressure, pH, etc…, on prefixed values.
Consequently it can be stated that very complex processes could be developed only thanks to automatic control; this was unthinkable before.

The units and equipment described in this catalogue have been designed and produced to enable an exhaustive understanding of the mechanisms of automatic process control, and an actual testing on industrial control instruments.

All products have been designed and manufactured according to some essential principles:

- faithful reproduction of the design used in industry, although on reduced scale;
- use of industrial instruments (sensors, transducers, actuators) of the best trademarks available on the market (ABB, Foxboro, E&H, etc…);
- particular care to the quality of materials to ensure long lifetime and industrial standard with a large use of stainless steel (frameworks, tanks, pipes and valves) and of borosilicate glass (tanks and columns);
- application of the most advanced technologies for system control and supervision;
- wide choice of sizes and of control type (PID control, PLC, free signals).

The equipment and units described in this catalogue have been divided into four categories:

- INSTRUMENTATION
- PLANTS
- UNITS
- BENCH TOP UNITS

The category of "Instrumentation" includes units designed to help students become familiar with and understand the operation of the equipment normally used for process measurements (flow, level, etc.).
The category of "Plants" includes the equipment of bigger size enabling to control 2 process variable at the same time; mod. UNIPRO/EV enables to control four variables.
The category of "Units" includes the equipment of intermediate size enabling to control 1, 2, 3 or 4 process variables according to models.
The category of "Bench top units" includes smaller equipment that can be placed on a table. These units are of rather low cost, but they use instruments of the same level as that of the equipment of the other two categories.

Most "Units" and "Bench top Units" will be available in the following versions:

- standard version, with board-type PID controller;
- special version with board-type PLC; model's name is the same of standard version's, but with subscript "p" (e.g.: FCp/EV);
- special version with free signals; model's name is the same of standard version's, but with subscript "x" (e.g.: FCx/EV).

The version with "free signals" does not include any controller nor PLC, but it is equipped with an interface with input and output signals that can be connected with a PID controller (included in the equipment) or with an external PLC.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25-C

INDUSTRIAL PROCESS CONTROL

INSTRUMENTATION

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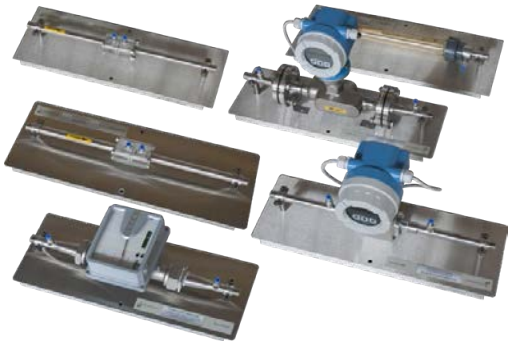
FLOW MEASUREMENT TRAINER

Mod. FMT/EV



INTRODUCTION

This wheeled trainer is used to investigate the operation principles of a wide range of flow meters available as accessories.
A pump is used to transport the water in a close circuit where the flow meters can be installed in two measuring positions: vertical or horizontal. A valve is used to adjust the flow rate.
The trainer is equipped with a high precision magnetic induction flow meter for reference measurement and for flow meters calibration, with two two-tube manometers and a differential pressure transmitter for measuring the pressure drop on the flow meters.
A voltage source powers is available for the supply of some optional flow meters.

TRAINING PROGRAM:

This unit enables to deepen the following issues:

- Principles of operation and types of flow meters
- Calibration of different flow meters
- Correct installation and connection of flow meters
- Effect of position on measurements
- Plot of pressure losses for the flow meters

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with 4 castors with wheel brake
- Tank made of AISI 304 stainless steel, capacity 60 l
- Pump made of AISI 304 stainless steel, 300 l/min @ 10 m
- Power supply 24Vdc, with connecting terminals
- Magnetic induction flow, range 0 - 80 l/min
- Differential pressure transmitter made of AISI 316 stainless steel, range 0-2 bar
- Two two-tube manometers, range 0-1000 mmH_2O
- Switchboard IP55 including ELCB

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)
Dimensions: 1800 × 600 × 1900 (h) mm
Weight: 154 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

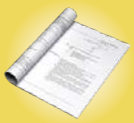
- Tap water

ACCESSORIES (NOT INCLUDED)

- Mod. FMT1/EV Rotameter
- Mod. FMT2/EV Rotameter with Transducer
- Mod. FMT3/EV Electromagnetic Flow Meter
- Mod. FMT4/EV Ultrasonic Flow Meter
- Mod. FMT5/EV Venturi Nozzle
- Mod. FMT6/EV Pitot Tube
- Mod. FMT7/EV Orifice Plate Flow Meter
- Mod. FMT8/EV Measuring Nozzle
- Mod. FMT9/EV Paddle Wheel Flow Meter
- Mod. FMT10/EV Vortex Flow Meter
- Mod. FMT11/EV Orifice Plate Flow Meter with Transducer
- Mod. FMT12/EV Turbine Wheel Flow Meter
- Mod. FMT13/EV Bypass Flow Meter
- Mod. FMT14/EV Baffle Plate Flow Meter

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK



PRESSURE MEASUREMENT TRAINER

Mod. PMT/EV

INTRODUCTION

This table-top trainer includes 2 tube and 2 dial manometers that can used to investigate the demonstration of different pressure measurement methods.
Test pressures (positive pressure and vacuum) in the mbar range are generated with the supplied syringe.
The manometers can be combined using quick couplings.
An additional Bourdon tube manometer can be calibrated with a dead-weight tester.

TRAINING PROGRAM:

This unit enables to deepen the following issues:

- Familiarization with different pressure measurement methods
- Operation of a Bourdon tube manometer
- Pressure measurements with U-tube and Bourdon tube manometers
- Calibration of Bourdon tube manometer

TECHNICAL CHARACTERISTICS:

- Deadweight tester of AISI 304 stainless steel, equipped with a set of weights being able to produce pressures up to 2 bars
- Bourdon tube manometer with transparent dial for showing the internal mechanism, range 0-2.5 bar
- U tube manometer, 0-500 mmH_2O
- Inclined tube manometer, 0-500 mmH_2O
- Capsule manometer, 0-60 mbar
- Capsule manometer, -60 - 0 mbar
- Plastic syringe

Dimensions: 1200 × 410 × 820 (h) mm
Weight: 30 kg

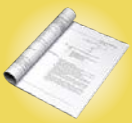
REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- 1 liter of water

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK



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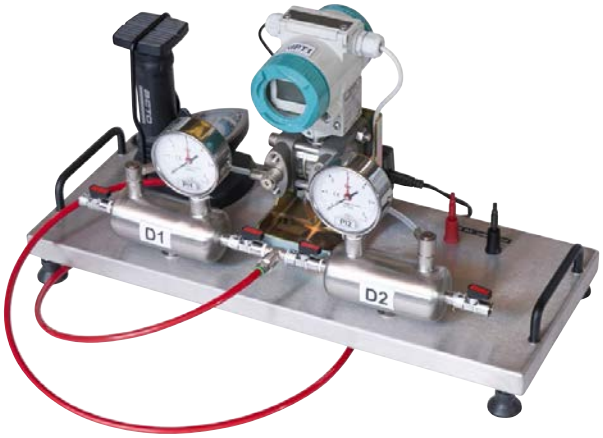
DIFFERENTIAL PRESSURE TRANSMITTER TRAINER

Mod. DPTT/EV

INTRODUCTION

This table top model comprises of two pressure chambers: one for high pressure and one for low pressure. The two pressure chambers are equipped with pressure gauge. The differential pressure transmitter is connected to the two chambers. The pressure is built by a foot air pump. Digital display is provided to indicate the differential pressure transmitter output.



TRAINING PROGRAM:

This unit enables to deepen the following issues:

- Familiarization with differential pressure transmitter
- Operation of a differential pressure transmitter

TECHNICAL CHARACTERISTICS:

- Differential pressure transmitter, made of AISI 316 stainless steel, range 0-6 bar, with 3 ½ DIGIT LCD display, output 4-20 mA
- Two AISI 304 stainless steel chambers with manometer
- Foot air pump

Power supply: 230 Vac 50 Hz single-phase - 50 VA
(Other voltage and frequency on request)
Dimensions: 600 × 260 × 340 (h) mm
Weight: 15 kg

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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LEVEL MEASUREMENT TRAINER

Mod. LMT/EV

INTRODUCTION

This wheeled trainer is used to investigate the basic hydrostatic principles, installation, calibration and maintenance of process field instruments, using a column of water.
The device includes a transparent acrylic tank and a feeding tank. Instrumentation of different design and manufacture can be installed by means of quick couplings positioned on the equipment and on the tank.
A differential pressure transmitter is included.

TRAINING PROGRAM

This unit enables to deepen the following issues:

- Level measurement in open tank
- Level measurement in close tank
- Level measurement with "wet leg"
- Zero suppression

TECHNICAL CHARACTERISTICS

- Framework of AISI 304 stainless steel with 4 castors with wheel brake
- Piping and valves of AISI 304 and AISI 316 stainless steel
- Transparent acrylic column tank, capacity 12 l
- Wet leg demonstration tube, made of transparent acrylic material
- Main tank made of AISI 304 stainless steel, capacity 60 l
- Safety valve
- Switchboard IP55 including ELCB
- Power supply 24Vdc, with connecting terminals
- Differential pressure transmitter made of AISI316 stainless steel, 4-20 mA output

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)
Dimensions: 1360 × 600 × 1900 (h) mm
Weight: 106 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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GUIDED RADAR TRAINER
Mod. CART1/EV

INTRODUCTION

The trainer includes a radar level measuring device positioned inside a transparent tank. The student can perform experiments with the measurement device adjusting the level in the tank by means of a pump.
A tuning fork level switch is used as high level safety system.

TRAINING PROGRAM

This unit enables to deepen the following issues:

- Level measurement in an open tank with a guided radar transmitter
- Level measurement in a closed tank with a guided radar transmitter
- Operation of a tuning fork level switch

TECHNICAL CHARACTERISTICS

- Framework of AISI 304 stainless steel with 4 castors with wheel brake
- AISI 304 stainless steel piping and valves
- Transparent acrylic level tank
- Tank made of AISI 304 stainless steel
- Guided radar level transmitter
- Tuning fork level switch
- Centrifugal pump
- Switchboard

Power supply: 230 Vac 50 Hz single-phase - 750 VA
(Other voltage and frequency on request)
Dimensions: 1360 × 600 × 1900 (h) mm
Weight: 108 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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CAPACITANCE LEVEL TRANSMITTER TRAINER

Mod. CART4/EV

INTRODUCTION

The trainer includes a capacitance level measuring device positioned inside a transparent tank. The student can perform experiments with the measurement device adjusting the level in the tank by means of a pump.
A tuning fork level switch is used as high level safety system.

TRAINING PROGRAM

This unit enables to deepen the following issues:

- Level measurement in an open tank with a capacitive level transmitter
- Level measurement in a closed tank with a capacitive level transmitter
- Operation of a tuning fork level switch

TECHNICAL CHARACTERISTICS

- Framework of AISI 304 stainless steel with 4 castors with wheel brake
- AISI 304 stainless steel piping and valves
- Transparent acrylic level tank
- Tank made of AISI 304 stainless steel
- Capacitance level transmitter
- Tuning fork level switch
- Centrifugal pump
- Switchboard

Power supply: 230 Vac 50 Hz single-phase - 750 VA
(Other voltage and frequency on request)
Dimensions: 1360 × 600 × 1900 (h) mm
Weight: 105 kg

REQUIRED UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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FREE WAVE RADAR LEVEL TRANSMITTER TRAINER

Mod. CART5/EV

INTRODUCTION

The trainer includes a radar level measuring device positioned inside a transparent tank. The student can perform experiments with the measurement device adjusting the level in the tank by means of a pump.
A tuning fork level switch is used as high level safety system.

TRAINING PROGRAM

This unit enables to deepen the following issues:

- Level measurement in an open tank with a free wave radar transmitter
- Level measurement in a closed tank with a free wave radar transmitter
- Operation of a tuning fork level switch

TECHNICAL CHARACTERISTICS

- Framework of AISI 304 stainless steel with 4 castors with wheel brake
- AISI 304 stainless steel piping and valves
- Transparent acrylic level tank
- Tank made of AISI 304 stainless steel
- Free wave radar level transmitter
- Tuning fork level switch
- Centrifugal pump
- Switchboard

Power supply: 230 Vac 50 Hz single-phase - 750 VA
(Other voltage and frequency on request)
Dimensions: 1360 × 600 × 1900 (h) mm
Weight: 106 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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25-C

PROCESS CONTROL PLANTS

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CALIBRATION TRAINER

Mod. CALT/EV

INTRODUCTION

The calibration trainer is used to investigate the functioning of electrical and pneumatic control loop components such as transmitters and control valves.
Electrical and pneumatic signals can be generated.
Two pressure regulators with manometers are included to generate pneumatic signals and calibrate manometers at high pressure.
A height-adjustable tank with scale is used to generate low pressures for manometer calibration.
Two direct voltage sources are included as auxiliary power sources for components requiring an electrical supply.
Direct current signals can be sent and measured with two controllers.
Two precision manometers allow measurement of pneumatic output signals from control loop components.
Various control loop components such as transducers, control valves and controllers are available as accessories.
They are mounted on the calibration trainer and connected by way of the supplied hoses and cables.

TRAINING PROGRAM:

Together with the accessory control loop components:

- Functioning of control loop components (transmitters, actuators, controllers)
- Familiarization with pneumatic and electrical signals
- Correct connection of control loop components
- Functioning of control loop components
- Calibration of manometers

TECHNICAL CHARACTERISTICS:

- Welded framework in AISI 304 stainless steel, with 4 castors with brake
- Two pressure regulators, range 0...1,6 bar and 0... 6 bar
- Height-adjustable tank, range 0 – 1000 mmwc
- 2 controllers with 4-20 mA input and 4-20 mA output
- Two 24 VDC voltage sources
- Two precision manometers, range 0...1,6 bar, 0...10 bar, D=160mm

OPTIONAL ACCESSORIES:

- Pneumatic differential pressures transmitter with range of 0 to 500 mm H_2O
- Electronic differential pressure transmitter with range of 0 to 500 mm H_2O
- Pneumatic pressure transmitter with measuring range of 0 to 6 bar
- Electronic pressure transmitter with measuring range of 0 to 6 bar
- Residual pressure electronic transmitter
- Level transmitter with capacitive sensor
- Pressure switch
- Thermostat
- Bourdon gauges
- Precision thermometers
- Pneumatic control valve
- Positioner for pneumatic valves
- Electro-pneumatic converter with 4 to 20 mA output signal / 0.2 to 1 bar
- Pneumatic electric converter with output signal of 0.2 to 1 bar / 4 to 20 mA

Power supply: 230 Vac 50 Hz single-phase - 2,3 kVA
(Other voltage and frequency on request)
Dimensions: 1140 × 1000 × 1500 (h) mm
Weight: 80 kg

REQUIRED UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air @ 8 bar

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

CALIBRATION OF ELECTRONIC AND PNEUMATIC INSTRUMENTS

Mod. REGA-TAR/EV

INTRODUCTION

This bench enables to carry out the necessary calibrations of electric, electronic and pneumatic instruments that are usually installed in industry.
The equipment consists of a console mounted on a desk that includes a set of instruments enabling the user to be trained in servicing, calibration and control of electronic and pneumatic instruments.

TRAINING PROGRAM:

This equipment enables to carry out calibrations and checks on:

- pressure gauges
- pressure switches
- thermostats
- pneumatic differential pressure transmitters
- electronic differential pressure transmitters
- pneumatic pressure transmitters
- electronic pressure transmitters
- pneumatic indicators
- electronic indicators
- electronic controllers/indicators
- pneumatic level transmitters
- electronic level transmitters
- pneumatic recorders
- electronic recorders
- pneumatic controllers/indicators
- hydrostatic level transmitters
- level transmitters with capacitive sensor
- pneumatic valves
- positioners

TECHNICAL CHARACTERISTICS:

- Framework of painted carbon steel
- 5 precision pressure gauges with ranges of: -1 to 0, 0 to 1.6, 0 to 4, 0 to 10 bar, and 0-30 psi, class 0.25
- 3 precision pressure reducers
- 12 pressure intakes
- 2 single limb manometers with case of AISI 304 stainless steel and with range of 0 – 1000 mm
- Digital multimeter with current range of 20 A and voltage range of 1200 V
- Signal generator of 4 to 20 mA
- Power supply of 12-24-48 Vd.c.
- Voltage variator of 0 to 200 V
- Thermocouple simulator
- Thermoresistance simulator

Power supply: 230 Vac 50 Hz single-phase - 2,3 kVA
(Other voltage and frequency on request)
Dimensions: 2000 x 1000 x 1500 mm
Weight: 155 kg

OPTIONAL ACCESSORIES:

- Pneumatic differential pressures transmitter with range of 0 to 500 mm H_2O
- Electronic differential pressure transmitter with range of 0 to 500 mm H_2O
- Pneumatic pressure transmitter with measuring range of 0 to 6 bar
- Electronic pressure transmitter with measuring range of 0 to 6 bar
- Residual pressure electronic transmitter
- Level transmitter with capacitive sensor
- Pressure switch
- Thermostat
- Bourdon gauge
- Precision thermometer
- Pneumatic control valve with positioner
- Electro-pneumatic converter with 4 to 20 mA output signal / 0.2 to 1 bar
- Pneumatic electric converter with output signal of 0.2 to 1 bar / 4 to 20 mA

REQUIRED UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air: 5 Nm^3/h @ 8 bar

SUPPLIED WITH

HANDBOOK WITH OPERATING AND CALIBRATION INSTRUCTIONS

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FLOW-RATE AND PRESSURE CONTROL

Mod. REGA-F/EV

INTRODUCTION

This equipment enables to carry out several tests on flow-rate and pressure control of a liquid (water) or of a gas (air); 4 different types of flowmeters are used (Venturi tube, calibrated orifice, magnetic induction flowmeter, variable area flowmeter) and they are inserted in a closed circuit including a tank and a recycle pump. Pressure is controlled by two pneumatic valves in split-range. A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Measuring instruments of pressure and flow rate
- Response and characteristics of process
- Tuning techniques of controllers
- Controlling flow-rate and pressure of gases and of liquids
- Split-range control
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Storage tank of AISI 304 stainless steel with capacity of 80 l
- Centrifugal pump with case and rotor of stainless steel; Q = 4 m^3/h, head of 30 m
- Venturi tube of transparent Plexiglas®
- Calibrated diaphragm of AISI 304 stainless steel
- Electronic magnetic induction flow transmitter of AISI 316 stainless steel with 4 to 20 mA output signal
- Electronic variable area flow transmitter-indicator of AISI 316 stainless steel with range of 40 to 4000 l/h and 4 to 20 mA output signal
- 2 electronic differential-pressure transmitters of AISI 316 stainless steel with 4 to 20 mA output signal
- 2 pneumatic control valves of AISI 316 stainless steel for pressure control in split-range, Cv = 1.25 and 5
- Pneumatic control valve of AISI 316 stainless steel for flow rate control, Cv = 5
- 3 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic pressure transmitter of AISI 316 stainless steel with range of 0 to 6 bar and 4 to 20 mA output signal
- Electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- Emergency pushbutton
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)
Dimensions: 2200 × 750 × 2000 (h) mm
Weight: 250 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (2 female valves of ¼"): 1 Nm^3/h @ 6 bar, for instruments, and 50 Nm^3/h @ 6 bar, when air is used as process fluid
- Tap water (valve with ½" hose connector)

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

TEMPERATURE AND FLOW-RATE CONTROL

Mod. REGA-T/EV

INTRODUCTION

The equipment consists of a jacketed reactor with stirrer that is fed with tap water; this reactor is heated by the hot water recirculating in its jacket via a centrifugal pump; this hot water is output by a shell-and-tube exchanger heated by steam. Measuring the flow rate (controlled by a pneumatic valve) with a calibrated diaphragm will enable to control of the flow rate feeding the reactor. The control loop of temperature in the reactor is carried out in cascade with the flow rate of steam heating the exchanger. A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Measuring instruments of temperature and flow rate
- Cascade control of temperature
- Determining dead time, response and characteristics of process
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Tank of AISI 304 stainless steel with capacity of 40 l
- Jacketed reactor of AISI 304 stainless steel, with stirrer, capacity of 25 l
- 3 pass shell-and-tube exchanger of AISI 304 stainless steel and exchange surface of 0.6 m^2
- Steam trap of AISI 304 stainless steel
- Centrifugal pump with case and rotor of stainless steel, Q_{max} = 4000 l/h, H_{max} = 30 m
- Pneumatic valve of AISI 316 stainless steel for controlling the flow rate of water, Cv = 1.25
- Pneumatic valve of AISI 316 stainless steel for controlling the flow rate of steam, Cv = 0.32
- Pt100 thermoresistance with sheath of AISI 316 stainless steel
- Electronic variable area flow transmitter-indicator of AISI 316 stainless steel with range of 25 to 250 l/h
- Calibrated diaphragm of AISI 304 stainless steel for measuring steam flow rate
- Electronic differential-pressure transmitter of AISI 316 stainless steel for measuring the flow rate of steam with 4 to 20 mA output signal
- Thermometer with range of 0 to 120 °C
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- Emergency pushbutton
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)
Dimensions: 1700 x 800 x 1900 (h) mm
Weight: 310 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): P = 1 Nm^3/h @ 6 bar
- Steam (valve of ½"): 20 kg/h @ 4,5 bar
- Tap water (valve with ½" hose connector): 250 l/h @ 2 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

STEAM GENERATOR MOD. SCT04/EV
- NOT INCLUDED -

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LEVEL AND FLOW-RATE CONTROL

Mod. REGA-L/EV

INTRODUCTION

The equipment consists of a glass column fed by a centrifugal pump connected with a storage tank. Another centrifugal pump makes the water recirculate from the column to the tank. The flow rate of the water entering the column can be controlled by a pneumatic valve inserted in the discharge of the feed pump, whereas the level in the column can be controlled by a pneumatic valve inserted in the discharge of the recirculation pump. A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Measuring instruments of level and flow rate
- Determining dead time, response and characteristics of the process
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Storage tank of AISI 304 stainless steel with capacity of 80 l
- 2 centrifugal pumps with case and rotor of AISI 304 stainless steel, Q_{max} = 4 m³/h, H_{max} = 30 m
- Column of borosilicate glass, DN 200, H = 1000 mm
- Electronic differential-pressure flow transmitter of AISI 316 stainless steel with 4 to 20 mA output signal
- Calibrated diaphragm of AISI 304 stainless steel
- Electronic differential-pressure level transmitter of AISI 316 stainless steel with 4 to 20 mA output signal
- 2 pneumatic valves of AISI 316 stainless steel, Cv = 2.5
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- Emergency pushbutton
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 2 kVA
(Other voltage and frequency on request)
Dimensions: 2000 × 850 × 2000 (h) mm
Weight: 300 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 1 Nm³/h @ 6 bar
- Tap water (valve with ½" hose connector)

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

PRESSURE AND FLOW-RATE CONTROL

Mod. REGA-P/EV

INTRODUCTION

The equipment consists of a hydraulic circuit that enables to control pressure and flow rate of compressed air or of tap water. This circuit includes three tanks used to study the effect of system volume on control parameters, a pneumatic valve for controlling pressure and two pneumatic valves for the split-range control of flow rate. A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Split-range control
- Measuring instruments of pressure and flow rate
- Response and characteristics of the process
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- 3 tanks of AISI 304 stainless steel, DN 200 with capacity of 20 l 4 solenoid valves of ½"
- 2 pneumatic valves of AISI 316 stainless steel for pressure and flow rate control, Cv = 2.5
- Pneumatic valve of AISI 316 stainless steel for flow rate control, Cv = 0.32
- Electronic pressure transmitter of AISI 316 stainless steel with range of 0 to 6 bar and 4 to 20 mA output signal
- Electronic differential-pressure transmitter of AISI 316 stainless steel for measuring flow rate with 4 to 20 mA output signal
- 3 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton
- Piping and valves of AISI 304 and 316 stainless steel
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)
Dimensions: 1900 x 750 x 1900 (h) mm
Weight: 220 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"):
  1.5 Nm^3/h @ 6 bar for instruments
  50 Nm^3/h @ 6 bar for process feeding
- Tap water (valve with ½" hose connector): 1500 l/h @ 2 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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pH CONTROL

Mod. REGA-pH/EV

INTRODUCTION

This system consists of a stirred reactor that is fed with an acid solution by a metering pump. Controlling the flow rate of another metering pump that sends a basic solution into the reactor, will enable to control the pH inside the reactor.
A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Response and characteristics of the process
- Determining the dead time
- Tuning techniques of controllers
- System supervision via software SCADA
- Calibration of a pH-meter

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- 3 tanks of borosilicate glass with capacity of 25 l
- Jacketed reactor of AISI 316 stainless steel with stirrer and capacity of 15 litres
- Microprocessor pH transmitter indicator with 4 to 20 mA output signal
- Measuring electrode
- Double body metering pump of AISI 316 stainless steel, including a pneumatic actuator driven by signal of 0.2 to 1 bar
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card
- Piping and valves of AISI 304 and 316 stainless steel
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Dimensions: 1700 × 800 × 2200 (h) mm
Weight: 310 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply: 400 Vac 50 Hz three-phase - 2 kVA (Other voltage and frequency on request)
- Compressed air (female valve of ¼"): 15 Nm^3/h @ 6 bar max.
- Tap water (valve with ½" hose connector)

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

MULTI-PROCESS CONTROL

Mod. UNIPRO/EV

INTRODUCTION

This system consists of a glass column fed by a centrifugal pump; this pump is connected with a tank heated by an electric resistor.
Another centrifugal pump will make the water recirculate from the column into the tank via an air-cooled heat exchanger.

This system enables to control:

- the flow rate of water entering the column, via a pneumatic valve inserted in the discharge of feed pump
- the water level in the column, via a pneumatic valve inserted in the discharge of recirculation pump
- the temperature of the water coming out of the air-cooled exchanger, by the control of fan speed
- the fan speed individually, or in cascade with temperature.

A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Cascade control
- Response and characteristics of the process
- Determining the dead time
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Tank of borosilicate glass with capacity of 20 l, including heating element of 3000 W, digital thermostat and variable-speed stirrer
- Column of borosilicate glass with capacity of 10 litres
- 2 centrifugal pumps of AISI 304 stainless steel, Q_{max} = 4000 l/h, H_{max} = 30 m
- Air-cooled heat exchanger, including motor, cooling fan and tachometer generator
- Electronic flow-rate transmitter of AISI 316 stainless steel, including calibrated diaphragm with range of 0 to 600 l/h and 4 to 20 mA output signal
- Electronic differential-pressure transmitter of AISI 316 stainless steel, for measuring level, with 4 to 20 mA output signal and range of 0 to 500 mm H_2O
- 2 pneumatic control valves of AISI 316 stainless steel, Cv = 2.5
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Piping and valves of AISI 304 and 316 stainless steel
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton
- 2 electronic microprocessor PID controllers with 4-line Liquid-Crystal Display (LCD) and serial card
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Dimensions: 1700 x 970 x 2000 (h) mm
Weight: 270 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply: 400 Vac 50 Hz three-phase - 6,5 kVA (Other voltage and frequency on request)
- Compressed air (female valve of ¼"): 1 Nm^3/h @ 6 bar
- Distilled water: 30 litres

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

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25-C

25-C

PROCESS CONTROL UNITS

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FLOW-RATE CONTROL

Mod. FC/EV including PID controller
Mod. FCf/EV with free signals
Mod. FCx/EV including PID controller, with free signals

INTRODUCTION

This compact unit of easy handling enables to carry out tests of flow-rate control on a closed circuit.
A centrifugal pump transfers the water from the feeding tank into the circuit; flow rate is measured by a differential-pressure transmitter connected with a calibrated orifice and it is controlled by a pneumatic valve.
When connected with the laboratory network of compressed air, this unit also enables to control the flow rate of a gas (air).

This unit is available in three versions:
- Mod. **FC/EV**, including an industrial PID controller
- Mod. **FCf/EV**, with free signals; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **FCx/EV**, including an industrial PID controller and with free signals.

The units mod. FC/EV and FCx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning techniques of a controller
- Response to a noise

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Electronic differential-pressure transmitter of AISI 316 stainless steel with 4 to 20 mA output signal
- Calibrated orifice of AISI 304 stainless steel
- Steel tank of 20 litres
- Centrifugal pump with case and rotor of AISI 304 stainless steel, Q = 4 m^3/h, H = 30 m
- Pneumatic control valve of AISI 316 stainless steel, Cv = 2.5
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Safety valve
- Switchboard IP55 including plant synoptic and ELCB
- Pipes and valves of AISI 304 and 316 stainless steel
- Measurements on liquids and gases (water and air)
- This unit can be connected in series with module mod. PC/EV for the simultaneous control of pressure and flow rate, and with modules mod. LC/EV and TC/EV, for the simultaneous control of level, temperature and flow rate
- Only for mod. FC/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. FCf/EV: connection panel for external control devices
- Only for mod. FCx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)
Dimensions: 1350 x 700 x 1900 mm
Weight: 100 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Compressed air (2 female valves of ¼"):
  0.3 Nm^3/h @ 6 bar (max.), when water is used as process fluid, and 25 Nm^3/h @ 6 bar, when air is used as process fluid

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. FCf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. FC/EV and FCx/EV: it must be installed before shipment, not as upgrade)

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LEVEL CONTROL

Mod. LC/EV — including PID controller
Mod. LCf/EV — with free signals
Mod. LCx/EV — including PID controller, with free signals

INTRODUCTION

This compact unit of easy handling enables to carry out several tests of level control on a closed circuit.
A centrifugal pump transfers the water from the feeding tank into the tank where level is controlled; another centrifugal pump makes the water recirculate from the control tank into the feeding tank.
Level is measured by a differential-pressure transmitter and is controlled by a pneumatic valve inserted in the discharge of the recirculation pump.

This unit is available in three versions:

- Mod. **LC/EV**, including an industrial PID controller
- Mod. **LCf/EV**, with free-signal connections; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **LCx/EV,** including an industrial PID controller and with free signals.

The units mod. LC/EV and LCx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning techniques of a controller
- Response to a noise

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Storage tank of borosilicate glass with capacity of 10 l
- Column of borosilicate glass (level control tank), DN 150, H = 600 mm
- 2 centrifugal pumps with case and rotor of AISI 304 stainless steel, Q_{max} = 4 m³/h, H_{max} = 30 m
- Electronic differential-pressure transmitter of AISI 316 stainless steel with 4 to 20 mA output signal
- Pneumatic control valve of AISI 316 stainless steel, Cv = 2.5
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Flowmeter of stainless steel and glass with range of 100 to 1000 l/h
- Switchboard IP55 including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- This unit can be connected in series with modules mod. FC/EV and TC/EV for the simultaneous control of level, flow rate and temperature
- Only for mod. LC/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. LCf/EV: connection panel for external control devices
- Only for mod. LCx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 2 kVA
(Other voltage and frequency on request)
Dimensions: 1350 x 700 x 1600 mm
Weight: 100 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Compressed air (female valve of ¼"): 0,3 Nm³/h @ 6 bar max.

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. LCf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. LC/EV and LCx/EV: it must be installed before shipment, not as upgrade)

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PRESSURE CONTROL

Mod. PC/EV — including PID controller
Mod. PCf/EV — with free signals
Mod. PCx/EV — including PID controller, with free signals

INTRODUCTION

This compact unit of easy handling enables to carry out several tests of pressure control on a circuit of variable volume.
The pressure supplied by the laboratory network of compressed air, is measured by a pressure transmitter and it is controlled by a pneumatic valve inserted in the inlet line; a tank can be inserted in the circuit to vary the system volume.

This unit is available in three versions:

- Mod. **PC/EV**, including an industrial PID controller
- Mod. **PCf/EV**, with free-signal connections; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **PCx/EV**, including an industrial PID controller and with free signals.

The units mod. PC/EV and PCx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning techniques of a controller
- Response to a noise
- Effect of system volume on control parameters

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Steel tank of 20 litres
- Safety valve
- Pneumatic control valve of AISI 316 stainless steel, Cv = 2.5
- Electronic pressure transmitter of AISI 316 stainless steel with range of 0 to 6 bar and 4 to 20 mA output signal
- Flowmeter of stainless steel and glass for measuring the flow rate of air, range of 2 to 20 m^3/h
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Thermometer with range of 0 to 60 °C
- Bourdon gauge of stainless steel with range of 0 to 6 bar
- Switchboard IP55 including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- This unit can be connected in series with module mod. FC/EV for the simultaneous control of pressure and flow rate
- Only for mod. PC/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. PCf/EV: connection panel for external control devices
- Only for mod. PCx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serialcard, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 0,5 kVA
(Other voltage and frequency on request)
Dimensions: 1350 x 700 x 1700 mm
Weight: 85 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 30 Nm^3/h @ 6 bar max.

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. PCf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. PC/EV and PCx/EV: it must be installed before shipment, not as upgrade)

TEMPERATURE CONTROL

Mod. TC/EV — including PID controller
Mod. TCf/EV — with free signals
Mod. TCx/EV — including PID controller, with free signals

INTRODUCTION

This compact unit of easy handling enables to carry out several tests of temperature control on a closed circuit for hot water.
A centrifugal pump makes the hot water recirculate from the heating tank to a plate-type exchanger cooled by tap water.
Temperature is measured by a thermoresistance and it is controlled by a pneumatic valve inserted in the inlet line of cold water; a delay pipe can be inserted in the circuit to vary the system dead time.

This unit is available in three versions:

- Mod. **TC/EV**, including an industrial PID controller
- Mod. **TCf/EV**, with free-signal connections; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **TCx/EV**, including an industrial PID controller and with free signals.

The units mod. TC/EV and TCx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning techniques of a controller
- Response to a noise
- Effect of dead time on control parameters

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Tank of borosilicate glass with capacity of 20 litres
- Electric resistor, P = 3 kW
- Plate-type exchanger of AISI 304 stainless steel with exchange surface of 0.2 m^2
- Centrifugal pump with case and rotor of AISI 304 stainless steel, Q_{max} = 3 m^3/h, H_{max} = 30 m
- Pneumatic control valve of AISI 316 stainless steel, Cv = 2.5
- Pt100 thermoresistance with sheath of AISI 316 stainless steel
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Switchboard IP55 including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- This unit can be connected in series with modules mod. FC/EV and mod. LC/EV for the simultaneous control of temperature, flow rate and level
- Only for mod. TC/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. TCf/EV: connection panel for external control devices
- Only for mod. TCx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 4 kVA
(Other voltage and frequency on request)
Dimensions: 1350 x 600 x 1600 mm
Weight: 115 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 4 Nm^3/h @ 6 bar max.
- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar max.
- Water drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. TCf/EV:

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. TC/EV and TCx/EV: it must be installed before shipment, not as upgrade)

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pH CONTROL

Mod. pHC/EV including PID controller
Mod. pHCf/EV with free signals
Mod. pHCx/EV including PID controller, with free signals

INTRODUCTION

This unit consists of a stirred reactor that is fed with an acid solution by a metering pump. Controlling the flow rate of another metering pump that sends basic solution into the reactor will enable to control the pH.
This unit is available in three versions:

- Mod. **pHC/EV**, including an industrial PID controller
- Mod. **pHCf/EV**, with free-signal connections; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **pHCx/EV**, including an industrial PID controller and with free signals.

The units mod. pHC/EV and pHCx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Response and characteristics of the process
- Determining dead time
- Tuning techniques of controllers

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Reactor of glass with stirrer of AISI 316 stainless steel, and capacity of 3 litres
- Electronic pH transmitter indicator with 4 to 20 mA output signal
- 2 metering pumps with 4-20 mA input
- Tank of AISI 316 stainless steel with capacity of 40 l, for the acid solution
- Tank of AISI 316 stainless steel with capacity of 40 l, for the basic solution
- Product collection tank of AISI 316 stainless steel with capacity of 80 l
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Piping and valves of AISI 316 stainless steel
- Only for mod. pHC/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. pHCf/EV: connection panel for external control devices, included in the switchboard

- Only for mod. pHCx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and interface with free signals

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)
Dimensions: 1600 x 600 x 1700 mm
Weight: 95 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 4 Nm^3/h @ 6 bar max.
- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar max.
- Water drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. pHCf/EV:

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. pHC/EV and pHCx/EV; it must be installed before shipment, not as upgrade)

FLOW-RATE AND LEVEL CONTROL

Mod. FLC/EV

INTRODUCTION

This unit consists of a glass column that is fed by a centrifugal pump connected with a storage tank. Another centrifugal pump makes the water recirculate from the column to the reactor.
The water entering the column can be controlled by a pneumatic valve inserted in the discharge of the feed pump and the level in the column can be controlled by another pneumatic valve inserted in the delivery of the recirculation pump.
Flow rate can be controlled even if compressed air is used as process fluid.
A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Measuring instruments of level and flow rate
- Response and characteristics of the process
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Storage tank for water of AISI 304 stainless steel and capacity of 20 litres
- Safety valve
- Column of borosilicate glass, DN 100, H = 600 mm
- Electronic differential-pressure transmitter of AISI 316 stainless steel, for measuring flow rate, with 4 to 20 mA output signal
- Calibrated diaphragm of AISI 304 stainless steel
- Electronic differential-pressure transmitter of AISI 316 stainless steel, for measuring level with range of 0 to 500 mm H_2O and 4 to 20 mA output signal
- 2 centrifugal circulation pumps with case and rotor of AISI 304 stainless steel, Q = 4 m^3/h
- 2 pneumatic control valves of AISI 316 stainless steel, Cv = 2.5
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic microprocessor PID controller with serial card
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 2 kVA
(Other voltage and frequency on request)
Dimensions: 1500 x 700 x 1900 mm
Weight: 140 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 1 Nm^3/h @ 6 bar, for instruments, and 25 Nm^3/h @ 6 bar, when air is used as process fluid
- Tap water (valve with ½" hose connector)

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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FLOW-RATE, LEVEL AND PRESSURE CONTROL

Mod. SPI/EV

INTRODUCTION

This unit consists of a glass column that is fed by a centrifugal pump connected with a storage tank. Another centrifugal pump makes the water recirculate from the column to the reactor.

This unit enables to control:

- the flow rate of water, via a pneumatic valve inserted in the discharge of the feed pump;
- the level in the column, via a pneumatic valve inserted in the discharge of the recirculation pump
- the pressure inside the column, via a pneumatic valve.

A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Measuring instruments of level, flow rate and pressure
- Response and characteristics of the process
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Column of borosilicate glass, h = 1000 mm, d = 100 mm
- Tank for water of AISI 304 stainless steel with capacity of 100 litres
- 2 centrifugal pumps with case and rotor of AISI 304 stainless steel, Q = 4 m^3/h, maximum head of 30 m
- Pneumatic control valve of AISI 304 stainless steel, Cv = 4
- Pneumatic control valve of AISI 316 stainless steel, Cv = 0.32
- Electronic differential-pressure transmitter of AISI 316 stainless steel with range of 0 to 1000 mm H_2O and 4 to 20 mA output signal
- Calibrated diaphragm of AISI 304 stainless steel with flow rate of 0 to 5 m^3/h
- Variable-area flowmeter with range of 0.4 to 4 m^3/h
- Electronic transmitter of relative pressure, in AISI 316 stainless steel with range of 0 to 3 bar and 4 to 20 mA output signal
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic microprocessor PID controller, with 4-line Liquid Crystal Display (LCD) and serial card
- Piping and valves of AISI 304 and 316 stainless steel
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 2,5 kVA
(Other voltage and frequency on request)
Dimensions: 1600 x 700 x 2000 mm
Weight: 200 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 1,5 Nm^3/h @ 6 bar
- Tap water (valve with ½" hose connector)

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

FLOW-RATE, LEVEL, PRESSURE AND TEMPERATURE CONTROL

Mod. MPU/EV

INTRODUCTION

This unit has been conceived for the simultaneous automatic control of flow rate, level, temperature and pressure carried out by a multi-loop PID controller.
The design logic and the used instruments are of industrial type.
A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- ON-OFF control
- Proportional, Integral and Derivative control
- Measuring instruments of level, flow rate, pressure and temperature
- Determining dead time, response and characteristics of the process
- Tuning techniques of controllers
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Tank of AISI 304 stainless steel with capacity of 20 litres, for storing water
- Tank of AISI 304 stainless steel with capacity of 18 litres, for controlling level with safety valve
- Electric heating element of 3 kW
- Plate-type exchanger of AISI 304 stainless steel
- Electronic differential-pressure transmitter of AISI 316 stainless steel, for measuring flow rate, with 4 to 20 mA output signal
- Calibrated diaphragm of AISI 304 stainless steel
- 2 centrifugal curculation pumps with case and rotor of AISI 304 stainless steel, Q = 4 m^3/h
- 2 pneumatic control valves of AISI 316 stainless steel, Cv = 2.5
- 2 pneumatic control valves of AISI 316 stainless steel, Cv = 0.32
- 4 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Electronic differential-pressure transmitter of AISI 316 stainless steel, for measuring level with range of 0 to 500 mm H_2O and 4 to 20 mA output signal
- Electronic transmitter of relative pressure, in AISI 316 stainless steel with range of 0 to 2 bar and 4 to 20 mA output signal
- Variable-area flowmeter with range of 0 to 1000 l/h
- Pt100 thermoresistance
- Electronic microprocessor PID controller, with 4-line Liquid Crystal Display (LCD) and serial card
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Piping and valves of AISI 304 and 316 stainless steel
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Dimensions: 1800 x 700 x 1850 mm
Weight: 140 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply: 400 Vac 50 Hz three-phase - 6 kVA (Other voltage and frequency on request)
- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar
- Compressed air (1 female valve of ¼"): 0.3 Nm^3/h @ 6 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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FLOW-RATE CONTROL AND STUDY OF VALVES

Mod. CVU/EV

INTRODUCTION

This mobile unit enables to study several types of control valves (optional accessories, mod. CVU-1/EV, mod. CVU-2/EV and mod. CVU-3/EV) and the flow-rate control, on a closed circuit including a recirculation pump and a storage tank. Flow rate and head loss are measured on the valve (optional accessory) controlled by an industrial controller. Valves with both electric and pneumatic actuator can be used. A control and data-acquisition software (SCADA) for Windows enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Measuring head losses and flow rate
- Determining Kv and Cv of a valve
- Determining the characteristic curve of a valve
- Recording a step response
- Adjusting the positioner
- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning techniques of a controller
- System supervision via SCADA software

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Storage tank of AISI 304 stainless steel with capacity of 70 litres
- Centrifugal pump of AISI 304 stainless steel, Q_{max} = 80 l/min, H_{max} = 22 m H_2O
- Electronic microprocessor PID controller, with 4-line Liquid Crystal Display (LCD) and serial card
- 2 pressure transducers with range of 0 to 2.5 bar
- Magnetic induction flowmeter of stainless steel with range of 0 to 60 l/min
- Switchboard IP55 including ELCB and digital displays for pressure before and after the valve, positioner output and flow rate
- Reducer-filter for compressed air
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)
Dimensions: 1400 x 600 x 1500 mm
Weight: 143 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 10 Nm^3/h @ 6 bar
- Tap water (valve with ½" hose connector)

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

- Pneumatic air-to-open control valve, with positioner and by-pass (mod. CVU-1/EV)
- Pneumatic air-to-close control valve, with positioner and by-pass (mod. CVU-2/EV)
- Electric control valve with by-pass (mod. CVU-3/EV)

PROCESS CONTROL
BENCH TOP UNITS

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FLOW-RATE CONTROL

Mod. FCB/EV including PID controller
Mod. FCBf/EV with free signals
Mod. FCBx/EV including PID controller, with free signals

INTRODUCTION

This bench top unit enables to carry out several tests of flow-rate control and it can be connected with the water network or with the laboratory line of compressed air to reproduce the flow-rate control of a gas or of a liquid.

The flow inside the pipe is measured by a differential-pressure transmitter connected with a calibrated orifice and it is controlled by a pneumatic valve.

This unit is available in three versions:

- Mod. **FCB/EV**, including an industrial PID controller
- Mod. **FCBf/EV**, with free signals; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **FCBx/EV**, including an industrial PID controller and with free signals.

The units mod. FCB/EV and FCBx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

mod. FCBx/EV

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning techniques of a controller
- Response to a noise

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Electronic differential-pressure transmitter of AISI 316 stainless steel, with 4 to 20 mA output signal
- Calibrated orifice of AISI 304 stainless steel
- Pneumatic control valve of AISI 316 stainless steel, Cv = 2.5
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Safety valve
- Bourdon gauge of stainless steel with range of 0 to 6 bar
- Pressure gauge for measuring the output signal of I/P converter
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- Pipes and valves of AISI 304 and 316 stainless steel
- This unit can be connected in with module mod. PCB/EV for the simultaneous control of pressure and flow rate
- Only for mod. FCB/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. FCBf/EV: connection panel for external control devices
- Only for mod. FCBx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 0,5 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 600 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar max.
- Compressed air (2 female valves of ¼"): 0.3 Nm^3/h @ 1.5 bar, for instruments, and 25 Nm^3/h @ 6 bar, when air is used as process fluid

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. FCBf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. FCB/EV and FCBx/EV: it must be installed before shipment, not as upgrade)

SERVICE UNIT MOD. US-1/EV
for closed-circuit operations

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LEVEL CONTROL

Mod. LCB/EV including PID controller
Mod. LCBf/EV with free signals
Mod. LCBx/EV including PID controller, with free signals

INTRODUCTION

This bench top unit enables to carry out several tests of level control.
The level of a transparent tank is measured by a differential-pressure transmitter and is controlled by a pneumatic valve installed on the input of water inlet line.

mod. LCBx/EV

This unit is available in three versions:

- Mod. **LCB/EV**, including an industrial PID controller
- Mod. **LCBf/EV**, with free-signal connections; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **LCBx/EV**, including an industrial PID controller and with free signals.

The units mod. LCB/EV and LCBx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning a controller
- Response to a noise

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TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Pneumatic control valve of AISI 316 stainless steel, Cv = 1.25
- Electronic differential-pressure level transmitter, in AISI 316 stainless steel with range of 0 to 500 mm H_2O and 4 to 20 mA output signal
- Variable-area flowmeter of stainless steel and glass with range of 100 to 1000 l/h
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Graduated tank of Plexiglas with capacity of 5 litres
- Pressure gauge for measuring the output signal of I/P converter
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- Pipes and valves of AISI 304 and 316 stainless steel
- Only for mod. LCB/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. LCBf/EV: connection panel for external control devices
- Only for mod. LCBx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 0,5 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 600 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar max.
- Compressed air (female valve of ¼"): 0,3 Nm^3/h @ 1,5 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. LCBf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. LCB/EV and LCBx/EV: it must be installed before shipment, not as upgrade)

SERVICE UNIT MOD. US-1/EV
for closed-circuit operations

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PRESSURE CONTROL

Mod. PCB/EV including PID controller
Mod. PCBf/EV with free signals
Mod. PCBx/EV including PID controller, with free signals

INTRODUCTION

This bench top enables to carry out several tests of pressure control.
The pressure supplied by the laboratory network of compressed air, is measured by a pressure transmitter and it is controlled by a pneumatic valve inserted in inlet line; a tank can be inserted in the circuit to vary the system volume.

mod. PCBx/EV

This unit is available in three versions:

- Mod. **PCB/EV**, including an industrial PID controller
- Mod. **PCBf/EV**, with free signals; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **PCBx/EV**, including an industrial PID controller and with free signals.

The units mod. PCB/EV and PCBx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning a controller
- Response to a noise
- Effect of system volume on control parameters

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Pneumatic control valve of AISI 316 stainless steel, Cv = 2.5
- Electronic pressure transmitter of stainless steel with range of 0 to 6 bar
- Bourdon gauge of stainless steel with range of 0 to 6 bar
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Pressure gauge for measuring the output signal of I/P converter
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- This unit can be connected with module mod. FCB/EV, for the simultaneous control of pressure and flow rate
- Piping and valves of AISI 304 and 316 stainless steel
- Only for mod. PCB/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. PCBf/EV: connection panel for external control devices
- Only for mod. PCBx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 0,5 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 600 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (2 female valves of ¼"): 0.3 Nm^3/h @ 1.5 bar, and 25 Nm^3/h @ 6 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. PCBf/EV:

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. PCB/EV and PCBx/EV: it must be installed before shipment, not as upgrade)

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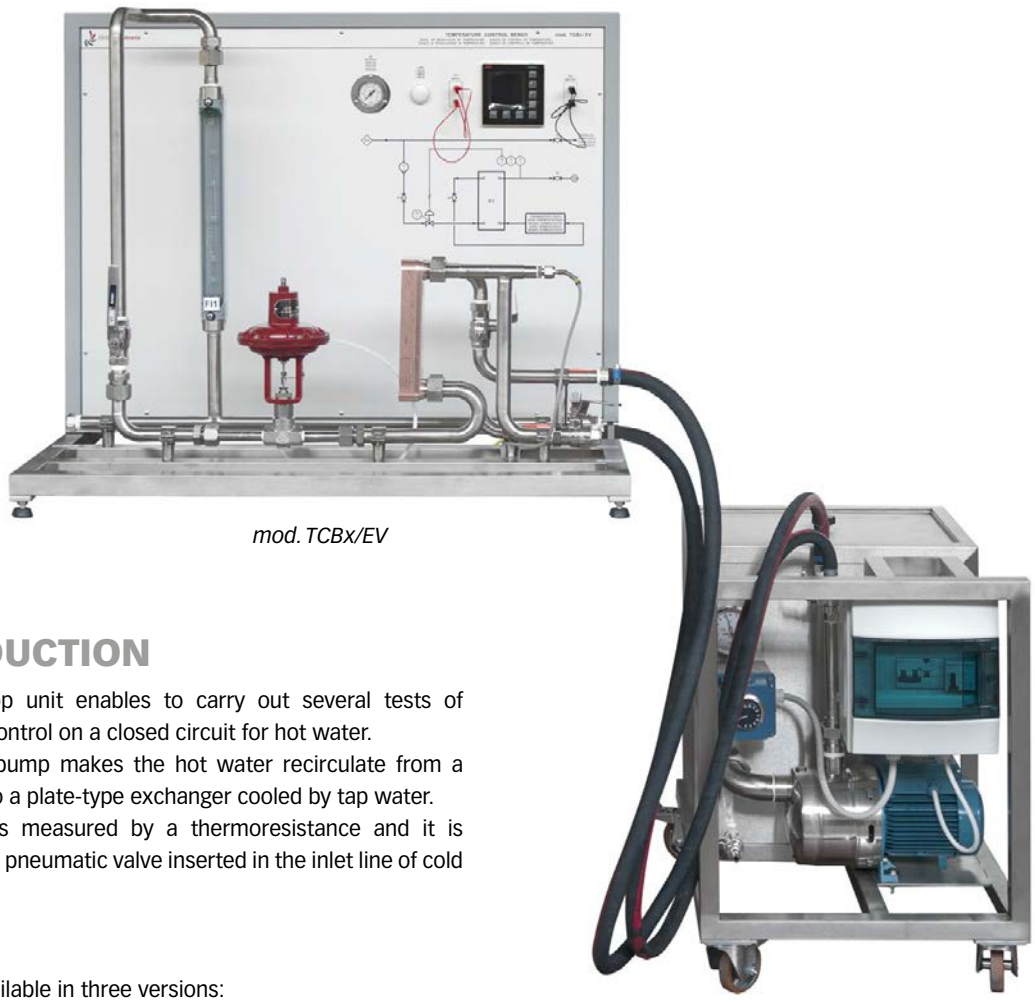
TEMPERATURE CONTROL

Mod. TCB/EV including PID controller
Mod. TCBf/EV with free signals
Mod. TCBx/EV including PID controller, with free signals



mod. TCBx/EV

INTRODUCTION

This bench top unit enables to carry out several tests of temperature control on a closed circuit for hot water.
A centrifugal pump makes the hot water recirculate from a heating tank to a plate-type exchanger cooled by tap water.
Temperature is measured by a thermoresistance and it is controlled by a pneumatic valve inserted in the inlet line of cold water.

This unit is available in three versions:

- Mod. **TCB/EV**, including an industrial PID controller
- Mod. **TCBf/EV**, with free signals; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **TCBx/EV**, including an industrial PID controller and with free signals.

The units mod. TCB/EV and TCBx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Open-loop control
- Closed-loop control
- Tuning a controller
- Response to a noise

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Pneumatic control valve of AISI 316 stainless steel, Cv = 0.13
- Electro-pneumatic converter, 4 to 20 mA / 0.2 to 1 bar
- Hot water generator with tank of AISI 304 stainless steel, electric heating system, recirculation pump of AISI 304 stainless steel and thermostat
- Pressure gauge for measuring the output signal of I/P converter
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- Pipes and valves of AISI 304 and 316 stainless steel
- Only for mod. TCB/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard
- Only for mod. TCBf/EV: connection panel for external control devices
- Only for mod. TCBx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 0,5 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 600 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 0,3 Nm^3/h @ 1,5 bar
- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR MOD. TCBf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. TCB/EV and TCBx/EV: it must be installed before shipment, not as upgrade)

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pH CONTROL

Mod. pHCB/EV
Mod. pHCBf/EV
Mod. pHCBx/EV

including PID controller with free signals

including PID controller, with free signals

INTRODUCTION

This bench top unit consists of a stirred reactor that is fed with an acid solution by a metering pump. Controlling the flow rate of another metering pump that sends basic solution into the reactor will enable to control the pH inside the reactor.

This unit is available in three versions:

- Mod. **pHCB/EV**, including an industrial PID controller
- Mod. **pHCBf/EV**, with free signal connections; the unit can be connected with the external control box mod. **PID/EV** or with customers' control unit
- Mod. **pHCBx/EV**, including an industrial PID controller and with free signals.

The units mod. pHCB/EV and pHCBx/EV are also provided with a control and data-acquisition software (SCADA) for Windows that enables the supervision of the system from a PC connected via the serial cable of the equipment.

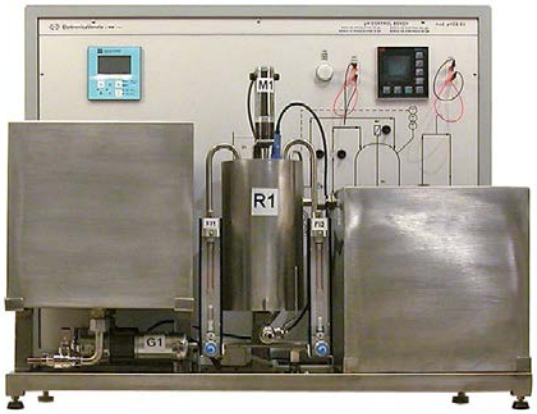
TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Setup of controllers
- Response and characteristics of the process
- Determining dead time
- Tuning the controller
- Calibrating a pH-meter

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- pH transmitter with range of 0-14 pH and 4-20 mA output
- 2 metering pumps with 4-20 mA input
- 2 tanks of AISI 316 stainless steel with capacity of 13 litres
- Tank of AISI 316 stainless steel with capacity of 26 litres
- Reactor of AISI 316 stainless steel with variable-speed (0-600 rpm) stirrer and capacity of 3 litres
- Piping and valves of AISI 316 stainless steel
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- Only for mod. pHCB/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard and including terminals for measuring input and output signals



- Only for mod. pHCBf/EV: connection panel for external control devices, included in the switchboard
- Only for mod. pHCBx/EV: electronic microprocessor PID controller with 4-line Liquid-Crystal Display (LCD) and serial card, mounted on the switchboard, and connection panel for external control devices

Power supply: 230 Vac 50 Hz single-phase - 0.5 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 600 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar max.
- Water drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

ACCESSORIES FOR Mod. pHCBf/EV (NOT INCLUDED)

- Control box with PID controller, mod. PID/EV

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

TWO-PEN RECORDER
(only for mod. pHCB/EV and pHCBx/EV; it must be installed before shipment, not as upgrade)

FLOW-RATE AND LEVEL CONTROL

Mod. FLCP/EV

INTRODUCTION

This bench top unit enables to carry out several tests of flow-rate and level control on a closed circuit including storage tank, recirculation pump, control valve, transmitter of flow rate and level, and PID controller.
The centrifugal pump sends the water from the storage tank, through a flowmeter, into a transparent tank where level is measured by a pressure sensor.
The control element consists of a pneumatic valve.
A manual valve inserted in the drain pipe of level tank enables to provoke noises in the system.
This unit also includes a control and data-acquisition software (SCADA) for Windows enabling the supervision of the system from a PC connected via the serial cable of the equipment.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Control of
  - flow rate
  - level
  - level and flow rate in cascade
- Tuning techniques of the controller

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Tank of AISI 304 stainless steel, for water with capacity of 15 litres
- Centrifugal pump, Q_{max} = 2.4 m^3/h, H = 38 m
- Graduated tank consisting of a transparent column with capacity of 8 litres
- Electronic flowmeter of AISI 316 stainless steel with range of 0 to 25 l/min (0-1500 l/h)
- Level transmitter of AISI 316 stainless steel with range of 0 to 500 mm H_2O (50 mbar)
- Pneumatic control valve of AISI 316 stainless steel
- Electronic microprocessor PID controller, with 4-line Liquid-Crystal Display (LCD) and serial card
- Pressure gauge for measuring the output signal of I/P converter
- Piping and valves of AISI 304 and 316 stainless steel
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 600 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 0,5 Nm^3/h @ 1,5 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

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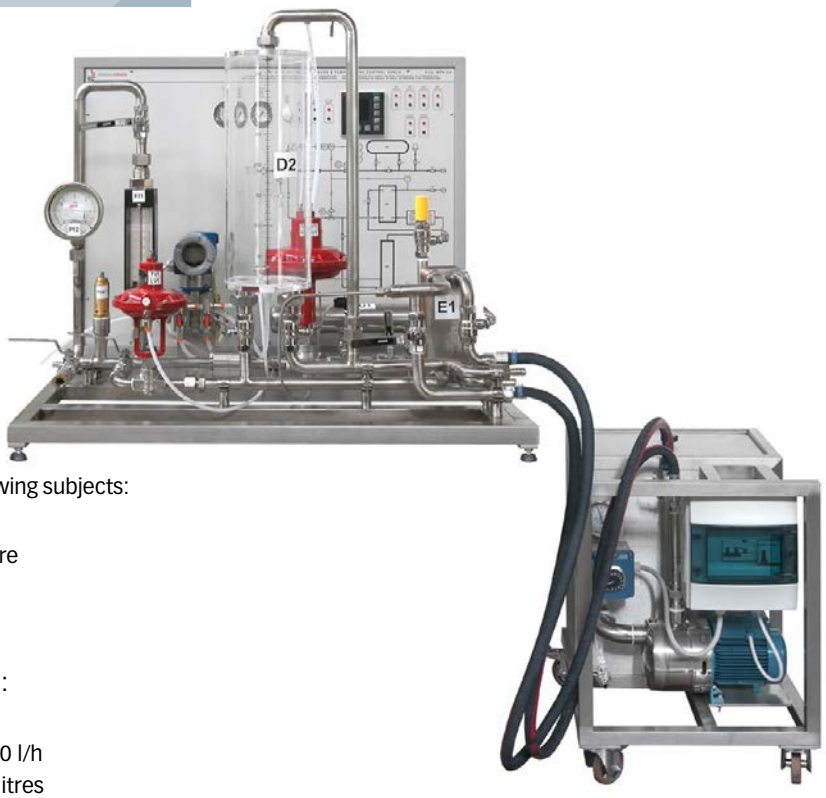
MULTI-PROCESS CONTROL (flow rate, level, pressure, temperature)

Mod. MPB/EV

INTRODUCTION

This bench top unit enables to carry out tests on the control of flow rate (of air and water), level, temperature and pressure on the same controller (a control at a time), and to modify the hydraulic circuit via manual valves.
A SCADA software enables to control the unit from a PC and to assess the system responses to noises.



TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Proportional, Integral and Derivative control
- Control of flow rate, level, pressure, temperature
- Tuning techniques of the controller

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Variable-area flowmeter with range of 0 to 1000 l/h
- Graduated tank of Plexiglas with capacity of 5 litres
- Plate-type exchanger of stainless steel
- Pneumatic control valve of AISI 316 stainless steel, Cv = 0.25
- Pneumatic control valve of AISI 316 stainless steel, Cv = 0.13
- 2 electro-pneumatic converters, 4 to 20 mA / 0.2 to 1 bar
- Safety valve
- Differential-pressure transmitter of AISI 316 stainless steel with range of 0 to 500 mm H_2O
- Pressure transmitter of AISI 316 stainless steel with range of 0 to 6 bar
- Pressure gauge for measuring the output signal of I/P converter
- Hot water generator with tank of AISI 304 stainless steel, electric heating system, recirculation pump of AISI 304 stainless steel and thermostat
- Piping and valves of AISI 304 and 316 stainless steel
- Switchboard of painted carbon steel with synoptic, ELCB and measuring terminals for input and output signals of the controller
- SCADA software (for control and data acquisition): this software runs in Windows and enables to control ON-OFF signals, analog signals coming from the PID controller, real-time trend and historical trend

Power supply: 230 Vac 50 Hz single-phase - 0,5 kVA
(Other voltage and frequency on request)
Dimensions: 850 x 800 x 750 mm
Weight: 50 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"):
  0,3 Nm^3/h @ 1,5 bar and 25 Nm^3/h @ 6 bar
- Tap water (valve with ½" hose connector):
  1000 l/h @ 2 bar max.

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

SERVICE UNIT MOD. US-1/EV
for closed-circuit operations
(excluding temperature control)

MULTI-PROCESS CONTROL (flow rate, level, pressure)

Mod. MPBM/EV

INTRODUCTION

This tabletop unit enables experiments on flow rate, level and pressure (one at a time), using either the supplied PID controller or a third-part controller acquired by the customer.
The user can control the unit via PC thanks to a SCADA software, which also allows evaluating the system's response to disturbances.

TRAINING PROGRAM:

With this unit, it is possible to develop and analyze the following topics:

- Proportional, integral and derivative control
- Control of:
  - Flow rate
  - Level
  - Pressure
- Tuning techniques for the PID controller

TECHNICAL SPECIFICATIONS:

- AISI 304 stainless steel tank with level indicator
- Regulating pneumatic valve of AISI 316 stainless steel, Cv = 0,25
- Electro-pneumatic converter: 4-20 mA/0,2-1 bar
- Differential pressure transmitter of AISI 316 stainless steel, scale 0-500 mmH_2O
- Pressure gauge to measure the I/P converter output signal
- AISI 304 and 316 stainless steel valves
- Microprocessor electronic PID controller with a 4-line LCD display, including serial interface card and terminals to measure input and output signals
- SCADA software for control and data acquisition: designed for Windows OS, it enables to manage ON-OFF signals, analog signals coming from the PID controller, real-time and historic trends.

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of ¼"): 0,3 Nm^3/h @ 1,5 bar
- Tap water (valve with ½" hose connector): 1000 l/h @ 2 bar max.

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

THEORETICAL-EXPERIMENTAL HANDBOOK

OPTIONAL

SERVICE UNIT MOD. US-1/EV
for closed-circuit operations
(excluding temperature control)

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25-C

MODULAR PROCESS CONTROL PLANT

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MODULAR PROCESS CONTROL PLANT
Mod. CPMS/EV

INTRODUCTION

The Modular Process Control, Mod. CPMS/EV, is an open and flexible solution for the study, through experiments, of the processes control fundamentals.

The service unit mod. CPM/EV includes a feeding tank, a pump, an electrical board and a structure for an easy and safe positioning of the required modules for the control loops.

A control and data acquisition software (SCADA), running under Windows, allows the supervision of the control loop from PC.

TRAINING PROGRAM:

- Design and electrical & mechanical assembling of a control loop
- The components of a control loop
- Optimizing a control loop
- PC supervision of a control loop

FLOW CONTROL

- Controller Module mod. CPM-R/EV
- Pneumatic valve Cv = 2.5 Module mod. CPM-PV2.5/EV
- I/P converte Module mod. CPM-IP/EV
- Pressure reducer Module mod. CPM-PR/EV

Using d/p cell (Photo A):

- Calibrated diaphragm Module mod. CPM-CO/EV
- Flow/Level transmitter Module mod. CPM-FLT/EV

Using magnetic induction flowmeter (Photo B):

- Magnetic induction flowmeter Module mod. CPM-FT/EV

A)

B)

LEVEL CONTROL

- Level system Module mod. CPM-LC/EV
- Controller Module mod. CPM-R/EV
- Pneumatic valve Cv = 0.13 Module mod. CPM-PV.13/EV
- I/P converter Module mod. CPM-IP/EV
- Flow/Level transmitter Module mod. CPM-FLT/EV
- Pressure reducer Module mod. CPM-PR/EV

PRESSURE CONTROL

- Pressure system Module mod. CPM-PC/EV
- Controller Module mod. CPM-R/EV
- Pneumatic valve Cv = 2.5 Module mod. CPM-PV2.5/EV
- I/P converter Module mod. CPM-IP/EV
- Pressure reducer Module mod. CPM-PR/EV

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TEMPERATURE CONTROL

- Temperature system Module — mod. CPM-TC/EV
- Controller Module — mod. CPM-R/EV
- Pneumatic valve Cv = 0.13 Module — mod. CPM-PV1.3/EV
- I/P converter Module — mod. CPM-IP/EV
- Pressure reducer Module — mod. CPM-PR/EV

OPTIONAL MODULES

- 3-pens recorder Module — mod. CPM-RC/EV
- 4-20 mA indicator Module — mod. CPM-MA/EV

SERVICE UNIT mod. CPM/EV

The service unit mod. CPM/EV includes a feeding tank, a pump, an electrical board and a structure for an easy and safe positioning of the required modules for the control loops.

TECHNICAL SPECIFICATIONS

- AISI 304 stainless steel structure with castors
- AISI 304 Stainless steel feeding tank, cap. 70 liters
- AISI 304 Stainless steel centrifugal pump
- Electrical board, IP55 protection grade, including automatic ELCB, START/STOP controls and 4 industrial single-ph sockets

Power supply: 230 Vac 50 Hz single-phase - 3,5 kVA
(Other voltage and frequency on request)
Dimensions: 1600 × 700 × 1870 (h) mm
Total weight: 150 Kg approx.

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed Air (2 x ¼" female valves): max. 400 l/min @ 6 bar

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

MODULE	CONTROL			
	FLOW	LEVEL	PRESSURE	TEMPERATURE
CPM-R/EV	X	X	X	X
CPM-CO/EV	X			
CPM-LC/EV		X		
CPM-PC/EV			X	
CPM-TC/EV				X
CPM-PR/EV	X	X	X	X
CPM-PV.13/EV		X		X
CPM-PV2.5/EV	X		X	
CPM-IP/EV	X	X	X	X
CPM-FLT/EV	X	X		
CPM-FT/EV	X			
CPM-RC/EV	X	X	X	X
CPM-MA/EV	X	X	X	X

The service unit mod. CPM/EV is used with the following modules to arrange the flow, level, pressure and temperature controls.

All modules are supplied with their respective instruction manuals.

CONTROLLER MODULE mod. CPM-R/EV

This module is a panel including an industrial microprocessor-type controller that can be installed in the Service Unit mod. CPM/EV.
The controller is pre-programmed and is easily connected following the instructions included in the supplied manual.
An additional pre-connected terminal board makes easy the connecting procedure and avoid any damages to the controller terminal board.

TRAINING PROGRAM

- Operation of an industrial controller
- Programming the controller using the front panel

TECHNICAL SPECIFICATIONS

- Display: 4-rows backlit LCD
- 4 control loops
- 1 universal input (TC, Pt100, 0/4-20 mA) programmed for Pt100
- 2 4-20 mA inputs
- 4 4-20 mA outputs
- 2 binary inputs/outputs
- 2 relays outputs
- RS-232 serial board

OPTIONAL

- Control and data acquisition software (SCADA) mod. SW - CPMS/EV: for Windows that allows the control loop supervision from PC

LEVEL CONTROL MODULE mod. CPM-LC/EV

This module is a panel including a transparent tank and can be easily installed in the Service Unit mod. CPM/EV.
The tank includes the couplings for connecting the level transmitter (mod. CPM-FLT/EV). The level is controlled by regulating the input water flow with the pneumatic valve of the module mod. CPM-PV.13/EV. The valve is controlled by the controller mounted in the module mod. CPM-R/EV.

TRAINING PROGRAM

- Level measurement using a pressure transmitter
- Assembling a level control loop

TECHNICAL SPECIFICATIONS

- Plastic trasparent graduated tank, h = 0-350 mm
- Pipes and valves in AISI 304 and AISI 316 stainless steel
- Quick couplings to the process

CALIBRATED ORIFICE MODULE mod. CPM-CO/EV

This module is a panel where it is placed a pipe with the calibrated orifice. It can be easily installed in the Service Unit mod. CPM/EV.
The calibrated orifice, connected to the differential pressure transmitter mod. CPM-FLT/EV, allows the measurement of the pipe flow. The flow is controlled by the pneumatic valve of the module mod. CPM-PV2.5/EV. The valve is controlled by the controller included in the module mod. CPM-R/EV.

TRAINING PROGRAM

- Flow measurement using a calibrated orifice
- Assembling a flow control loop

TECHNICAL SPECIFICATIONS

- AISI 304 stainless steel pipe
- AISI 304 stainless steel calibrated diaphragm
- Quick couplings to the process

PRESSURE CONTROL MODULE mod. CPM-PC/EV

This module is a panel where it is placed a pipe with an insertable tank. It can be easily installed in the Service Unit mod. CPM/EV.
The pressure, measured with a pressure transmitter, is controlled regulating the input air flow with the pneumatic valve of the module mod. CPM-PV2.5/EV. The valve is controlled by the controller of the module mod. CPM-R/EV.

TRAINING PROGRAM

- Operation principles of the pressure transmitter
- Assembling a pressure control loop

TECHNICAL SPECIFICATIONS

- AISI 304 and AISI 316 stainless steel pipes and valves
- AISI 304 stainless steel tank, cap. 0.9 liters
- Pressure transmitter:
  - IP65 protection grade
  - stainless steel body
  - 4-20 mA output
- Bourdon spring manometer, range 0÷6 bar
- Quick couplings to the process.

TEMPERATURE CONTROL MODULE mod. CPM-TC/EV

This module is a panel including a hot water circuit with an electrical resistance, and a cool water circuit with a heat exchanger. It can be easily installed in the Service Unit mod. CPM/EV.
The temperature is measured with a thermorresistance Pt100, and controlled by regulating the cooling water flow with the pneumatic valve of the module mod. CPM-PV2.5/EV. The valve is controlled by the controller of module mod. CPM-R/EV.

TRAINING PROGRAM

- Operation principles of the thermorresistance
- Assembling a temperature control loop

TECHNICAL SPECIFICATIONS

- AISI 304 and AISI 316 stainless steel pipes and valves
- Pt100 class A thermorresistance with AISI 316 stainless steel shield
- Electrical resistance, P = 3000 W
- AISI 304 stainless steel heat exchanger
- Analog thermometer, range 0-100 °C
- Quick couplings to the process

SERVICES

- Tap water: 1000 l/h @ 2 bar

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PNEUMATIC VALVE MODULE mod. CPM-PV.13/EV

This module is a panel including a pneumatic valve. It can be easily installed in the Service Unit mod. CPM/EV.
The valve is supplied with quick couplings for an easy connection to the process.

TRAINING PROGRAM

- Operation principles of a pneumatic valve
- Use of a valve for the temperature and level control
- Features of a pneumatic valve

TECHNICAL SPECIFICATIONS

- Pneumatic valve type "air open"
- AISI 316 stainless steel body
- Discharge coefficient = 0.13
- 3-15 psi actuator
- Quick couplings to the process

PNEUMATIC VALVE MODULE mod. CPM-PV2.5/EV

This module is a panel including a pneumatic valve. It can be easily installed in the Service Unit mod. CPM/EV.
The valve is supplied with quick couplings for an easy connection to the process.

TRAINING PROGRAM

- Operation principles of a pneumatic valve
- Use of a valve for the flow and pressure control
- Features of a pneumatic valve

TECHNICAL SPECIFICATIONS

- Pneumatic valve type "air open"
- AISI 316 stainless steel body
- Discharge coefficient = 2.5
- 3-15 psi actuator
- Quick couplings to the process

I/P CONVERTER MODULE mod. CPM-IP/EV

This module is a panel including an electropneumatic converter. It can be easily installed in the Service Unit mod. CPM/EV.
The converter is used to convert the controller output signal (4-20 mA) in a pneumatic signal (3-15 psi) to control the valve opening.

TRAINING PROGRAM

- Operation principles of an I/P converter
- Use of the converter in control loop

TECHNICAL SPECIFICATIONS

- IP55 protection grade
- Manometer for measuring the converter output pneumatic signal
- Quick couplings to the process

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PRESSURE REDUCER MODULE mod. CPM-PR/EV

This module is a panel including a pressure reducer, complete with filter. It can be easily installed in the Service Unit mod. CPM/EV.
The pressure reducer reduces the air pressure to the required value for supplying the electro-pneumatic converter mod. CPM-IP/EV.

TECHNICAL SPECIFICATIONS

- 5 µm filter
- Manometer, range 0-12 bar
- Quick couplings to the process

FLOW & LEVEL TRANSMITTER MODULE mod. CPM-FLT/EV

This module is a panel including a differential pressure transmitter. It can be easily installed in the Service Unit mod. CPM/EV.
The transmitter, connected to modules CPM-FC/EV and CPM-LC/EV, allows measurements of flow and level respectively.

TRAINING PROGRAM

- Operation principles of the differential pressure transmitter
- Connecting the differential pressure transmitter to the process
- Use of the differential pressure transmitter in a control loop

TECHNICAL SPECIFICATIONS

- IP55 protection grade
- AISI 316 stainless steel body
- Integrated LCD display and programming keyboard
- 4-20 mA output
- Quick couplings to the process

FLOW TRANSMITTER MODULE mod. CPM-FT/EV

This module is a panel including a magnetic induction flowmeter. It can be easily installed in the Service Unit mod. CPM/EV.

TRAINING PROGRAM

- Operation principles of a magnetic induction flowmeter
- Connecting a magnetic induction flowmeter to the process
- Use of a magnetic induction flowmeter in a control loop.

TECHNICAL SPECIFICATIONS

- IP55 protection grade
- AISI 316 stainless steel body
- Integrated LCD display and programming keyboard
- 4-20 mA output
- Quick couplings to the process

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RECORDER MODULE mod. CPM-RC/EV

The module is a panel including a two-color pen chart recorder. with adjustable paper speed. It can be easily installed in the Service Unit mod. CPM/EV.

TRAINING PROGRAM

- Recorder operation
- Recorder set-up
- Electrical connection of a recorder

TECHNICAL SPECIFICATIONS

- 1 Pt100 input
- 2 4-20 mA inputs
- 3 pens (green, red and blue)
- Paper speed = 0, 5, 10, 20, 60, 120, 240, 300, 360, 600, 720, 1800, 3600, 7200 mm/h

mA INDICATOR MODULE mod. CPM-MA/EV

The module is a panel including mA indicator. It can be easily installed in the Service Unit mod. CPM/EV.
The indicator is loop powered and features a 4 digit LCD display.

TRAINING PROGRAM

- Signal range 4-20 mA
- Electrical connection of an indicator

TECHNICAL SPECIFICATIONS

- High accuracy (max error 0,05%)
- 6 bit max resolution
- Thermal stability 0,05%/°K
- Analog input: 4-20 mA
- Power supply: loop powered
- Programming keyboard

SUPPLIED WITH

INSTRUCTION MANUAL FOR EACH MODULE

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25-C

ACCESSORIES AND SOFTWARE

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SERVICE UNIT

Mod. US-1/EV

INTRODUCTION

This unit has been designed to work with water in closed circuit, together with units mod. FCB/EV, LCB/EV and MPB/EV.

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Tank of AISI 304 stainless steel with capacity of 100 litres
- Centrifugal pump of stainless steel, Qmax = 4 m^3/h, Hmax = 30 m
- Piping and valves of AISI 304 and 316 stainless steel

Power supply: 230 Vac 50 Hz single-phase - 0,8 kVA
(Other voltage and frequency on request)
Dimensions: 610 x 550 x 600 mm
Weight: 25 kg

SUPPLIED WITH

OPERATIONAL HANDBOOK

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STEAM GENERATOR

Mod. SCT04/EV

INTRODUCTION

This steam generator is able to supply steam to the systems needing it.

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Production: 17 kg/h of steam at 4.5 bar
- 2 safety pressure switches
- Pressure gauge with range of 0 to 10 bar
- Softener for inlet water
- Switchboard complying with EC standards, protection degree: IP 55

Dimensions: 1350 x 500 x 1300 mm
Weight: 150 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply:
  400 Vac 50 Hz three-phase - 16 kVA
  230 Vac 50 Hz single-phase- 0,5 kVA - for softener
  (Other voltage and frequency on request)
- Tap water (valve with ½" hose connector): 20 l/h max.
- Floor drain

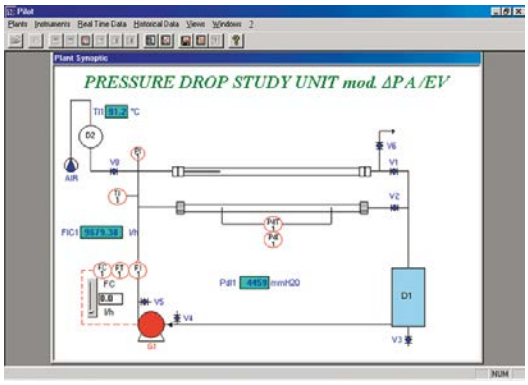
SUPPLIED WITH

OPERATIONAL HANDBOOK

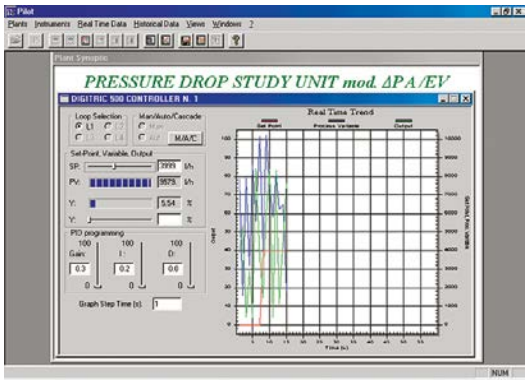
SUPERVISION SOFTWARE: PILOT FOR WINDOWS

Supervision software systems, specific for each plant, operate in Windows environment and they are supplied with the equipment of automated plants.
These software systems have been developed by Elettronica Veneta S.p.a. with the characteristics of industrial SCADA software and they enable:

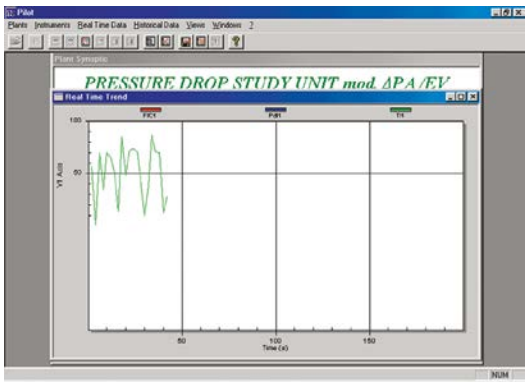
- to display the schematic diagram of the plant with the instantaneous values of process parameters
- to control ON–OFF signals, that is to switch pumps, compressors, resistors, etc…, on and off from PC.



- to communicate with the microprocessor PID controller included in the plant, that is to acquire all the data coming from the controller and to carry out all the operations that can be enabled from the fore panel of the instrument, from a PC (setting the set point and PID parameters, selecting automatic or manual operation, setting the output of every loop, etc...)



- to display the real-time trend of process parameters



- to display the historical trend of process variables.

There is no need of inserting any card in the PC to use this software: it is sufficient to connect the plant with the series port (COM1 or COM2) of the PC via the serial cable of the equipment.

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CONTROL BOX WITH PID CONTROLLER

Mod. PID/EV

INTRODUCTION

This box includes an industrial PID controller with connectors for input and output signals and it can be used not only to test the operations and functions of an industrial controller, but also for the control of process units with free signals.

TRAINING PROGRAM:

This unit enables to develop and analyze the following subjects:

- Structure and functions of a PID controller
- Configuring a controller
- Response of a controller

TECHNICAL CHARACTERISTICS:

- Configurable digital microprocessor controller
- Simple and intuitive use
- Back-lighted colour LCD screen
- 2 analog inputs with relevant connectors
- 1 continuous analog output with connector
- 2 relays with connector
- Serial interface with Modbus protocol

Power supply: 90-260 Vac 50/60 Hz single-phase - 16 VA
Dimensions: 400 x 300 x 250 mm
Weight: 5 kg

SUPPLIED WITH

OPERATIONAL HANDBOOK

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PRODUCTS INDEX
SORTED ALPHABETICALLY BY MODEL

IN	INSTRUMENTATION
PL	PROCESS CONTROL PLANTS
UN	PROCESS CONTROL UNITS
BT	PROCESS CONTROL BENCH TOP UNITS
MP	MODULAR PROCESS CONTROL PLANT
AS	ACCESSORIES AND SOFTWARE

ElettronicaVeneta

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