



CATALOGUE No. 36-B
ECOLOGY



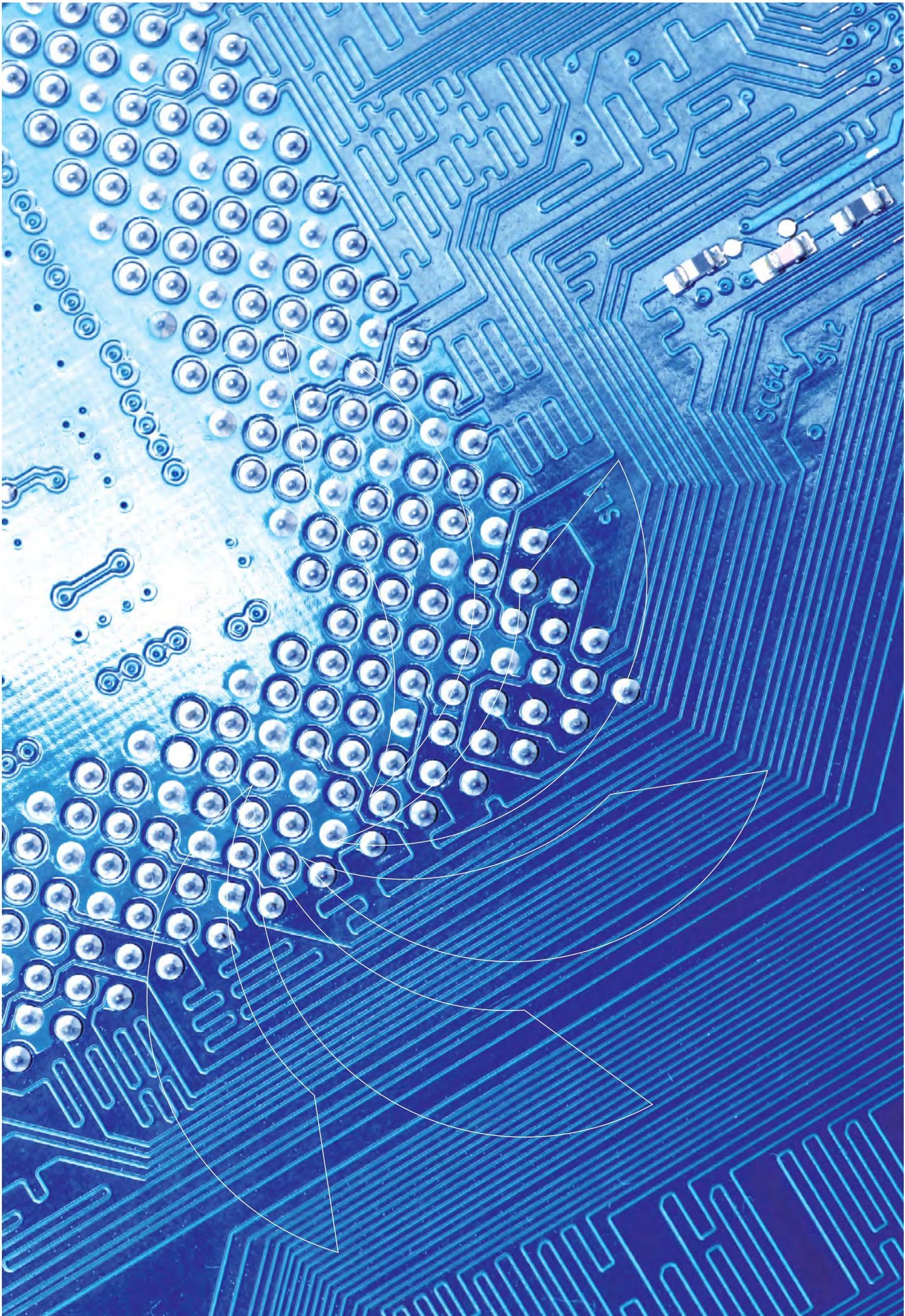


CATALOGUE No. 36-B
ECOLOGY

Ecology

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"MEDIUM" LINE

"SMALL" LINE

Mod. FA/EV
Mod. FAa/EV
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BT

BT 3
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ANAEROBIC WATER TREATMENT PILOT PLANT

"LARGE" LINE

"MEDIUM" LINE

"SMALL" LINE

Mod. BIO/EV
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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.

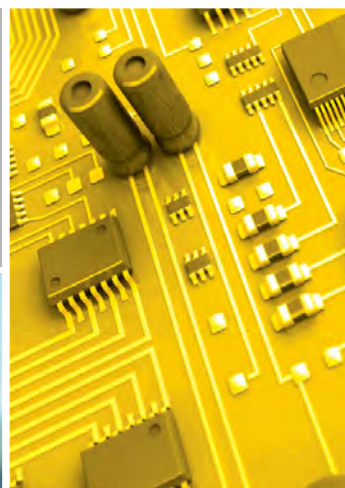
Increasing the efficiency of the didactic process improves and simplifies the integration of young students into the world of employment and justifies the material and human investments made in schools throughout the world.

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



View of a water treatment laboratory

The plan of investments in research and human resources started in 1984 and the intensive collaboration with Italian and foreign universities and with chemical, pharmaceutical and food-farming industries have enabled **Elettronica Veneta** to introduce their renewed line of products for ecology, with a right pride.

Products have been designed for their use in technical high schools and universities that intend to enrich their equipment with pilot plants and laboratory apparatuses for implementing an up-to-date and complete testing programme.

All the products have been designed and manufactured according to some principles considered essential by our company:

- faithful reproduction of the industrial design, although on a reduced scale;
- use of industrial instruments (sensors, transducers, actuators) of the best trademarks available on the market (ABB, Foxboro, E&H, etc...);
- particular care for the quality of materials for ensuring long lifetime and industrial standard with great use of stainless steel (supporting frameworks, tanks, pipes and valves) and of borosilicate glass (tanks and columns);
- application of the most advanced technologies of plant supervision and control;
- wide choice of sizes and of control types (manual, automated and computerized versions).

Thanks to these important characteristics our plants are also used in leading companies of chemical, pharmaceutical and food-farming sectors.

All the plants (excepting the desk-type versions) are mounted on a wheeled framework of stainless steel for an easier shift and they are equipped with switchboard including automatic differential switch.

All the plants shown in this catalogue (excepting the desk-type versions) are available in two versions:

- MANUAL;
- AUTOMATED.

The manual version is not equipped with any automation system and it cannot be connected with any PC; process parameters can be read directly on the instruments included in the plant and on the control board and they can be controlled completely in manual way.

The automated version is equipped with one or more microprocessor PID controllers that enable to control some process parameters automatically. Supervision is carried out by a PC via a SCADA software and it enables the operator to work on the plant without moving from his/her own workstation. Further details on supervision software will be available in the respective section of this catalogue.

Automated versions are particularly suitable also for the study of process control, as they represent an application to an actual process. The plants of this catalogue are subdivided into two sections: "Biological treatments" and "Chemical-physical treatments"; "Biological treatments" are furtherly subdivided into the following lines: "Small", "Medium" and "Large".

"**Small**" version includes desk-type equipment; it is rather economical, but it is interesting for the study of purification process.

"**Large**" version concerns the plants of bigger size and, consequently, of higher price; whereas "**Medium**", version includes the plants of intermediate size.





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PRINCIPLES OF DEPURATION

AERATION STUDY APPARATUS	MOD. ASA/EV	PD 3
FILTERABILITY INDEX UNIT	MOD. FIU/EV	PD 4
DEEP BED FILTER COLUMN	MOD. DBF/EV	PD 5
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MODEL SEDIMENTATION TANK	MOD. MST/EV	PD 8
PERMEABILITY AND FLUIDIZATION STUDY APPARATUS	MOD. PFSA/EV	PD 9
SEDIMENTATION STUDY APPARATUS	MOD. SSA/EV	PD 10

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AERATION STUDY APPARATUS

Mod. ASA/EV

INTRODUCTION

This equipment has been designed to study the phenomenon of oxygen transfer in air diffusion systems and the influence of chemical/physical parameters on oxygenation capacity.

TRAINING PROGRAM:

- Measurement of the absorption coefficient K_s and of the oxygenation capacity R
- Effects of:
 - the degree of mixing
 - temperature
 - air flow
 - depth of water
 - diffuser typology
 - water composition

TECHNICAL CHARACTERISTICS:

- Framework of stainless steel AISI 304
- Graduated tank of transparent methacrylate with capacity of 25 litres
- Diaphragm compressor
- Variable area flowmeter (0-12 l/min)
- Portable oxygen probe with display, range of 0-20 mg/l
- Variable speed stirrer
- 3 interchangeable diffusers

Power supply: 230 Vca 50 Hz single-phase - 0,2 KVA
(Other voltage and frequency on request)

Dimensions: 600 × 560 × 750 (h) mm

Weight: 60 Kg



REQUIRED UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water
- Drain

ACCESSORIES (NOT INCLUDED)

- Reactants: sodium sulfite and cobaltous chloride

SUPPLIED WITH

THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK



FILTERABILITY INDEX UNIT

Mod. FIU/EV

INTRODUCTION

This equipment enables to carry out filterability tests on suspensions filtered through a bed of a granular medium (sand or other material).

The bed is contained in a vertical pipe through which the suspension flows downwards from a funnel.

Flow is controlled by a valve and observed on a variable area flowmeter.

TRAINING PROGRAM:

- Principles of filtration through solid beds
- Use of coalescents
- Calculation of filterability index number

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Feeding funnel
- Test section tube: 38 mm x 60 mm
- Flowmeter: 5 to 25 l/h
- Differential water manometer: 0 to 500 mm
- 2 litres beaker
- Digital stop clock
- Digital thermometer

Dimensions: 500 × 500 × 1000 (h) mm

Weight: 40 Kg



SUPPLIED WITH

THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK



DEEP BED FILTER COLUMN

Mod. DBF/EV



INTRODUCTION

This equipment has been designed to study water filtration through sand filters.

Tests on this unit provide operational data which may be scaled up to full size.

TRAINING PROGRAM:

- Pressure increase depending on filtration time
- Pressure drop profile through the filter bed
- Concentration profile through the filter bed
- Demonstration of backwashing

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Filter column of clear methacrylate, $d = 100 \text{ mm}$, $h = 1350 \text{ mm}$, equipped with sampling valves and steel gauze mesh of bed support
- Centrifugal pump of AISI 304 stainless steel
- Variable area flowmeter
- 2 tanks of 350 litres
- Differential pressure gauge with 41 tubes
- 20 kg of filtering medium

Recommended accessory

- Turbidimeter

Power supply: 230 Vca 50 Hz single-phase - 0,5 KVA
(Other voltage and frequency on request)

Dimensions: 2000 × 800 × 2000 (h) mm

Weight: 150 Kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water
- Floor drain

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



FLOCCULATION TEST UNIT

Mod. FTU/EV

INTRODUCTION

This equipment has been designed to optimize the dosage of coalescent in sewage disposal, that is to carry out the well-known "jar test".

Multiple stirrers with reproducible stirring speeds allow to adopt standard conditions for the tests, that are the basic requirement for reproducible results.

A special switch available on the front panel enables to backlight the sample being examined for easier readings.

The rotation speed can be programmed from 10 to 300 r.p.m..



TRAINING PROGRAM:

- Determination of the optimal dosage of coagulant
- Determination of the optimal pH
- Effect of mixing
- Coagulation in presence of active carbons

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel, painted with epoxy paint
- Number of stirring positions: 6
- Stirring rods of stainless steel, adjustable in height by a selflocking chuck
- Rear panel: backlit and disconnectable
- DC gear motor
- Selector speed at each stirring position
- Electronic speed control: from 10 to 300 r.p.m.

Power supply: 230 Vca 50 Hz single-phase - 50 VA
(Other voltage and frequency on request)

Dimensions: 935 x 260 x 347mm

Weight: 17 Kg

SUPPLIED WITH

THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK



ION EXCHANGE UNIT

Mod. IEU/EV

INTRODUCTION

This unit has been designed to study the use of ion exchange resins in water softening and demineralization operations, by reproducing all the typical phases of this industrial process (softening, regeneration, washing, etc.)

TRAINING PROGRAM:

The unit allows studying and developing the following subjects:

- Measurement of the exchange capacity
- Water softening using cationic resins
- Demineralization using two-bed resins
- Regeneration operations and efficiency

TECHNICAL SPECIFICATIONS

- Stainless steel AISI 304 structure
- 20 l. PVC tank divided in 4 separated compartments
- 20 l. Treated water PVC tank
- 2 transparent PVC columns
- Peristaltic feeding pump
- Variable area flow meter, 0-134 ml/min, wetted parts made of PTFE
- 1 l. of anion resin
- 1 l. of cation resin
- Portable conductivity meter with display
- Valves and piping made of PP and PVC
- Kit for water hardness measurement

Power supply: 230 Vac 50 Hz single-phase - 0,2 kVA
(Other voltage and frequency on request)

Dimensions: 440 × 450 × 1000(h) mm (excluding the tanks)

Weight: 50 Kg



REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water

ACCESSORIES (NOT INCLUDED)

- Distilled water
- Hydrochloric acid
- Sodium hydroxide
- Calcium chloride
- Sodium chloride

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



MODEL SEDIMENTATION TANK

Mod. MST/EV

INTRODUCTION

This equipment has been designed to study the hydraulic behaviour and the settling efficiency of a sedimentation tank.

TRAINING PROGRAM:

- Displaying the hydraulic behaviour by a tracer
- Comparing actual and theoretical hydraulic behaviours
- Effect of the flow rate and of baffle position on sedimentation
- Determination of settling efficiency

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Tank of clear methacrylate with capacity of 80 litres and section for mixing tap water and suspension
- Suspension feed tank with capacity of 120 litres and recycle pump
- Variable area flowmeter for tap water
- Peristaltic pump for suspension, 0-170 l/h

Power supply: 230 Vca 50 Hz single-phase - 0.5 KVA
(Other voltage and frequency on request)

Dimensions: 1700 × 800 × 1500 (h) mm

Weight: 120 Kg



REQUIRED UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water
- Drain

ACCESSORIES (NOT INCLUDED)

- Turbidimeter

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



PERMEABILITY AND FLUIDIZATION STUDY APPARATUS

Mod. PFSA/EV

INTRODUCTION

This apparatus is designed to study and understand the flow of a liquid through a bed of solid particles, but it can also be used for filtration tests on real beds and waters.

A bed of granular medium (usually sand, glass beads, etc...) is placed in a vertical clear tube through which water can be made to flow in either a downwards or upwards direction. Water flow comes from a constant head tank connected with the water network and its rate is indicated by a variable area flowmeter.

Pressure drop across the bed can be measured either by a water manometer or a mercury manometer.

TRAINING PROGRAM:

- Pressure drops across solid beds
- Verification of Kozeny's equation
- Fluidization of a solid bed
- Measurement of permeability of a solid bed
- Attrition tests

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel
- Test section tube: 44 mm x 550 mm
- Flowmeter: 4-48 l/h
- Differential water manometer: 0 to 500 mm
- Differential mercury manometer: 0 to 500 mm
- Bed of glass beads
- Constant head tank of AISI 304 stainless steel

Dimensions: 750 × 500 × 1000 (h) mm

Weight: 50 Kg



REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water: 150 l/h at 0.5 bar
- Water drain

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



SEDIMENTATION STUDY APPARATUS

Mod. SSA/EV

INTRODUCTION

This apparatus has been designed for an easy study of the basics of sedimentation process.

Five graduated cylinders are mounted vertically on a lighting backboard. Each cylinder may be removed from the board for washing, filling and mixing operations.

These cylinders are filled with suspensions containing different sediments and measuring the changes in height of the various solid/liquid interfaces with respect to time will lead to determine the sedimentation rate.

The equipment is also provided with a digital stop clock and with three plastic beakers.



TRAINING PROGRAM:

- Effect of concentration on sedimentation rates
- Plotting settling rate curves
- Effect of suspension height on sedimentation rates
- Effect of coalescents

TECHNICAL CHARACTERISTICS:

- 5 graduated cylinders DN50, L = 1000 mm
- Backlighting of cylinders
- Digital stop clock
- Three 2-litre plastic beakers

Power supply: 230 Vca 50 Hz single-phase - 0.3 KVA
(Other voltage and frequency on request)

Dimensions: 750 × 400 × 1200 mm

Weight: 50 Kg

SUPPLIED WITH

THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK





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BIOLOGICAL TREATMENTS

AEROBIC
WATER TREATMENT
PILOT PLANT

"LARGE" LINE

mod. FA/EV
mod. FAa/EV

BT 3

"MEDIUM" LINE

mod. MFA-3/EV
mod. FA1c/EV

BT 5

BT 7

"SMALL" LINE

mod. DE/EV, DE1/EV

BT 9

ANAEROBIC
WATER TREATMENT
PILOT PLANT

"LARGE" LINE

mod. BIO/EV
mod. BIOa/EV

BT 11

"MEDIUM" LINE

mod. BIO1c/EV

BT 13

"SMALL" LINE

mod. DE/EV, DE2/EV

BT 9

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AEROBIC **WATER TREATMENT** **PILOT PLANT**

Mod. FA/EV
Mod. FAa/EV

manual
automated



INTRODUCTION

The activated sludge pilot plant consists of an oxidation reactor, of a settler and of a final chlorination tank, according to the traditional diagram of single-stage sewage treatment process. Biomass is oxidized in a reactor with agitator by the air blown by a compressor. The processed liquid is sent to the settler through an overflow.

The sludges settling on settler bottom are recycled by a recirculation pump into the oxidation tank.

The water flowing out of the settler is chlorinated and conveyed to a drain.

Process control, data acquisition and supervision are automatically carried out by a microprocessor controller and by a specific control and supervision software (only for mod. FAa/EV) that enables the remote control of various operational parameters.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- Purification efficiency versus the following parameters:
 - composition of water to be treated
 - residence time
 - organic load
 - pH in oxidation tank
 - concentration of dissolved oxygen
- Automatic PID control (only for mod. FAa/EV)
- Plant supervision (only for mod. FAa/EV)

TECHNICAL CHARACTERISTICS:

Mod. FA/EV

- Framework of AISI 304 stainless steel with castors
- Feed tank with capacity of 700 l
- Cylindrical oxidation reactor of transparent methacrylate, with capacity of 300 l, including an agitator of AISI 304 stainless steel with geared motor and air diffuser of AISI 316 sintered stainless steel
- Settler of transparent methacrylate, with capacity of 150 l
- Feed tank for hypochlorite solution, with capacity of 20 l
- Chlorination tank of transparent methacrylate, with capacity of 6 l
- Magnetic drive feed gear pump, with body of AISI 316 stainless steel, flow-rate 0 to 60 l/h
- Sludge recirculation magnetic drive gear pump, with body of AISI 316 stainless steel, flow rate 0 to 60 l/h
- Metering pump of sodium hypochlorite, flow rate of 0 to 1.5 l/h
- Diaphragm compressor with body of stainless steel, flow rate of 1.2 Nm³/h
- Board-type microprocessor-controlled pH-meter, with range of 2 to 12 pH and 4-20 mA output signal
- Board-type microprocessor-controlled dissolved oxygen meter, with range of 0 to 10 ppm and 4-20 mA output signal
- Flowmeter for measuring the feed flow rate of air to the reactor, with range of 0 to 1800 NI/h (only for mod. FA/EV)
- Electronic magnetic-induction transmitter of AISI 316 stainless steel for feed flow rate, with range of 0 to 60 l/h and 4 to 20 mA output signal
- Board-type electronic indicator of feed flow rate with range of 0 to 60 l/h
- Electronic magnetic-induction transmitter of stainless steel AISI 316 for sludge recirculation flow rate with range of 0 to 60 l/h and 4 to 20 mA output signal
- Board-type electronic indicator of sludge recirculation flow rate with range of 0 to 60 l/h
- Thermoresistance Pt 100 with sheath of AISI 316 stainless steel
- Board-type electronic temperature indicator
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton
- Plant synoptic
- Connecting lines and valves of AISI 304 and 316 stainless steel
- Max. feed: 1 kg/day of COD (1.7 g/l for a flow rate of 25 l/h)

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)

Dimensions: 2100 x 870 x 2400 mm

Weight: 280 kg

Mod. FAa/EV

Besides being provided with all the technical characteristics of mod. FA/EV, this model also includes the following additional equipment:

- Electronic transmitter of differential-pressure type in stainless steel AISI 316, for air flow rate, with range of 0 to 1500 NI/h and 4 to 20 mA output signal
- Calibrated diaphragm of AISI 304 stainless steel
- Pneumatic control valve of AISI 316 stainless steel for air flow rate, $C_v = 0.32$
- Electropneumatic converter (4 to 20 mA/0.2 to 1 bar)
- Digital microprocessor PID controller, with three control loops
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from PID controller, real-time trend and historical trend

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of 1/4"): 0.5 Nm³/h @ 6 bar (only for mod. FAa/EV)
- Tap water (valve 1/2" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows (only for mod. FAa/EV)

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

AEROBIC WATER TREATMENT PILOT PLANT

Mod. MFA-3/EV



INTRODUCTION

The activated sludge pilot plant consists of an oxidation reactor and of a settler according to the traditional diagram of single-stage sewage treatment process.

Biomass is oxidized in a reactor with agitator by the air blown by a compressor. The processed liquid is sent to the settler through an overflow. The sludges settling at settler bottom are recycled by a recycle pump into the oxidation tank.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- Purification efficiency versus the following parameters:
 - composition of water under to be treated
 - residence time
 - organic load
 - pH in oxidation tank
 - concentration of dissolved oxygen

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Feed tank with capacity of 300 l
- Cylindrical oxidation reactor of AISI 304 stainless steel, with capacity of 60 l, including an inspection window of transparent methacrylate and three overflows at different heights to vary reactor volume
- Agitator of AISI 304 stainless steel with geared motor
- Settler of AISI 304 stainless steel, with capacity of 30 l, provided with inspection window of transparent methacrylate
- 2 magnetic drive gear pumps (for feeding and recirculation), with body of AISI 316 stainless steel, flow-rate 0 to 60 l/h
- Air compressor with body of stainless steel, flow rate of 1.5 Nm³/h
- Air diffuser of AISI 316 sintered stainless steel
- 2 magnetic-induction flowmeters (for feeding and recirculation) with range of 0 to 60 l/h and 4 to 20 mA output signal
- Flowmeter for measuring air flow rate to oxidation reactor, with micro-valve; range of 0 to 180 Nl/h
- Thermoresistance Pt 100 with board-type digital temperature indicator
- Microprocessor-type electronic dissolved oxygen indicator-transmitter, with range of 0 to 10 ppm
- Microprocessor-type electronic pH indicator-transmitter, with range of 0 to 14 pH
- Digital indicator of feed flow rate
- Digital indicator of sludge recycle flow rate
- Connecting lines and valves of AISI 304 and 316 stainless steel
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)

Dimensions: 1550 x 670 x 1870 mm

Weight: 250 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water floor drain

SUPPLIED WITH

THEORETICAL – PRACTICAL – EXPERIMENTAL HANDBOOK



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

AEROBIC WATER TREATMENT PILOT PLANT

Mod. FA1c/EV



INTRODUCTION

The activated sludge pilot plant consists of an oxidation reactor and of a settler according to the traditional diagram of single-stage sewage treatment process.

Biomass is oxidized in a reactor with agitator by the air blown by a compressor. The processed liquid is then sent to the settler.

The sludges settling on settler bottom are recycled by a recirculation pump into the oxidation tank.

The water flowing out of the settler is conveyed to a drain.

Data acquisition is carried out by a specific software.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- Purification efficiency versus the following parameters:
 - composition of water to be treated
 - residence time
 - organic load
 - pH in oxidation tank
 - concentration of dissolved oxygen

TECHNICAL CHARACTERISTICS:

- AISI 304 stainless steel framework with castors
- Feed tank, 300 l capacity
- Cylindrical oxidation reactor of transparent methacrylate, 60 l capacity, including an AISI 304 stainless steel agitator with motor and air diffuser
- Settler of transparent methacrylate, 30 l capacity
- Peristaltic feed pump
- Sludge recirculation peristaltic pump
- Diaphragm compressor with body of stainless steel
- Microprocessor-controlled board-type pH-meter, with range of 2 to 12 pH, 4 to 20 mA output signal
- Microprocessor-controlled board-type rH-meter, with range of -1500 and +1500 mV, 4 to 20 mA output signal
- Microprocessor-controlled board-type dissolved oxygen meter, with range of 0 and 20 ppm, 4 to 20 mA output signal
- Electronic flowmeter for measuring air flow rate to reactor
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Data acquisition software for Windows

Power supply: 230 Vac 50 Hz single-phase - 1 KVA
(Other voltage and frequency on request)

Dimensions: 1700 x 700 x 1900 mm

Weight: 280 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running a recent version of MS Windows

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

WATER TREATMENT PILOT PLANT

Mod. DE/EV
Mod. DE1/EV
Mod. DE2/EV

service unit
aerobic purification system
anaerobic purification system



INTRODUCTION

This equipment consists of a service unit (mod. DE/EV) including two peristaltic pumps (for feeding and recycle) of variable speed and a compressor with flowmeter that can be coupled to the aerobic purification system (mod. DE1/EV) or to the anaerobic purification system (mod. DE2/EV).

The minimum purchasable configuration includes the service unit (mod. DE/EV) and one of the two purification systems.

Aerobic purification system mod. DE1/EV is a bench-top pilot plant including an oxidation tank and a settler according to the standard diagram.

Feeding and recirculation of sludges are carried out by the two peristaltic pumps of mod. DE/EV, whereas air feeding is ensured by some porous diffusers connected with the compressor of service unit.

Anaerobic purification system mod. DE2/EV is a desk-type pilot plant including an anaerobic digester with built-in settler.

Feeding and recirculation of sludges are carried out by the two peristaltic pumps of the service unit, whereas biomass is continuously stirred thanks to the compressor of service units that recycles gas from the top to the bottom of the digester.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

Mod. DE1/EV

- Study, simulation, sizing and optimization versus the following parameters:
 - hydraulic residence time
 - biomass volume
 - air flow rate
 - recycle ratio

Mod. DE2/EV

- Study, simulation, sizing and optimization versus the following parameters:
 - hydraulic residence time
 - recycle ratio
 - packing

TECHNICAL CHARACTERISTICS:

Mod. DE/EV

- Feed tank with capacity of 80 litres
- Tank of 80 litres for the collection of purified water
- Peristaltic feeding pump, with flow rate of 0 to 60 ml/min
- Peristaltic pump for sludge recycle, with flow rate of 0 to 60 ml/min
- Air compressor
- Flowmeter for air, with range of 0-10 l/min

Power supply: 230 Vac 50 Hz single-phase - 250 VA
(Other voltage and frequency on request)

Dimensions: 500 x 300 x 300 mm

Weight: 10 kg

Mod. DE1/EV

- Cylindrical oxidation tank of transparent methacrylate, with variable capacity (7, 8, 9 and 10 litres), provided with air diffusers
- Settler of transparent methacrylate with capacity of 5 litres

Dimensions: 700 x 300 x 600 mm

Weight: 9 kg

Mod. DE2/EV

- Cylindrical digester of transparent plastic material with capacity of 15 litres, including a settler

Dimensions: 500 x 300 x 600 mm

Weight: 7 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water drain

ACCESSORIES (NOT INCLUDED)

- Portable pH-meter
- Portable oximeter

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

ANAEROBIC WATER TREATMENT PILOT PLANT

Mod. BIO/EV manual
Mod. BIOa/EV automated



INTRODUCTION

This pilot plant consists of a reactor with built-in settler and floating head for hydraulic guard.

Sludges are fed and recycled by two gear pumps; a compressor will recycle gas from the top to the bottom of reactor keeping biomass stirred.

Biomass is heated by a heat exchanger included in the digester and connected with a diathermic-oil heating unit.

Process control, data acquisition and supervision are automatically carried out by a microprocessor controller and by a specific control and supervision software (only for mod. BIOa/EV) that enables the remote control of various operational parameters.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- Purification efficiency versus the following parameters:
 - recycle ratio
 - residence time
 - digester temperature
 - organic load
 - pH and rH
- Automatic PID control (only for mod. BIOa/EV)
- Plant supervision (only for mod. BIOa/EV)

TECHNICAL CHARACTERISTICS:

Mod. BIO/EV

- Framework of AISI 304 stainless steel with castors
- Feed tank with capacity of 700 l
- Anaerobic digester of AISI 316 stainless steel, with capacity of 350 l, equipped with oil heating system including a heat exchanger of AISI 304 stainless steel
- Electronic thermostat for control of heating temperature
- Thermoresistance Pt 100 with sheath of AISI 316 stainless steel
- Magnetic drive feed gear pump; body of AISI 316 stainless steel; flow-rate 0 to 60 l/h
- Magnetic drive sludge recycle gear pump with body of stainless steel AISI 316, flow rate of 0 to 60 l/h
- Diaphragm compressor with body of stainless steel, flow rate of 1200 Nl/h
- Electronic magnetic-induction feed flow rate transmitter of AISI 316 stainless steel, with range of 0 to 60 l/h and 4 to 20 mA output signal
- Board-type electronic indicator of feed flow rate, with range of 0 to 60 l/h
- Electronic magnetic-induction sludge recirculation flow rate transmitter of AISI 316 stainless steel, with range of 0 to 60 l/h and 4 to 20 mA output signal
- Board-type electronic indicator of sludge recirculation flow rate, with range of 0 to 60 l/h
- Microprocessor-controlled board-type pH-meter, with range of 2 to 12 pH, 4 to 20 mA output signal
- Microprocessor-controlled board-type rH-meter, with range of -1500 and +1500 mV, 4 to 20 mA output signal
- Pressure gauge with range of 0 to 50 mm H₂O
- Pressure switch for controlling pressure in the reactor
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton
- Connecting lines and valves of AISI 304 and 316 stainless steel

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)

Dimensions: 2300 x 1000 x 2020 mm

Weight: 290 kg

Mod. BIOa/EV

Besides being provided with all the technical characteristics of mod. BIO/EV, this model also includes the following additional equipment:

- Digital microprocessor PID controller with two control loops
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from PID controller, real-time trend and historical trend

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows (only for mod. BIOa/EV)

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

ANAEROBIC WATER TREATMENT PILOT PLANT

Mod. BIO1c/EV



INTRODUCTION

This pilot plant consists of a reactor with built-in settler. Sludges are fed and recycled by two peristaltic pumps; a compressor will recycle gas from the top to the bottom of reactor keeping biomass stirred.

Data acquisition is carried out by a specific software.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- Purification efficiency versus the following parameters:
 - recycle ratio
 - digester temperature
 - organic load
 - pH and rH

TECHNICAL CHARACTERISTICS:

- AISI 304 stainless steel framework with castors
- Feed tank, 80 l capacity
- Transparent plastic cylindrical digester with settler, 15 l capacity
- Peristaltic feed pump
- Sludge recirculation peristaltic pump
- Diaphragm compressor with body of stainless steel
- Microprocessor-controlled board-type pH-meter, with range of 2 to 12 pH, 4 to 20 mA output signal
- Microprocessor-controlled board-type rH-meter, with range of -1500 and +1500 mV, 4 to 20 mA output signal
- Microprocessor-controlled board-type dissolved oxygen meter, with range of 0 and 20 ppm, 4 to 20 mA output signal
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Data acquisition software for Windows

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)

Dimensions: 1600 x 700 x 1900 mm

Weight: 250 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running a recent version of MS Windows

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.



36-B



ECOLOGY

CHEMICAL-PHYSICAL TREATMENTS

**AUTOMATED PILOT PLANT WITH
FILTER PRESS AND MICRO-FILTER**

MOD. FP-1S/EV CP 3

FILTER PRESS PILOT PLANT

MOD. FP-2S/EV CP 5

GRAVITY FILTRATION PILOT PLANT

MOD. FTR1c/EV CP 7

FILTRATION PILOT PLANT

MOD. FTR/EV
MOD. FTRa/EV CP 9

**COAGULATION, FLOCCULATION AND
SETTLING PILOT PLANT**

MOD. FSE/EV
MOD. FSEa/EV CP 11

REVERSE OSMOSIS PILOT PLANT

MOD. OI/EV
MOD. OIa/EV CP 13

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36B-E-CP

AUTOMATED PILOT PLANT WITH FILTER PRESS AND MICROFILTER

Mod. FP-1S/EV



INTRODUCTION

This plant is provided with a filter press and a microfilter (tangential filtration) that are fed by a screw pump connected with a tank filled with the solution to be filtered. Then filtrate is collected into another tank.

A microprocessor PID controller enables to operate at constant pressure or flow rate.

Process control, data acquisition and supervision are automatically carried out by a microprocessor controller and by a specific control and supervision software that enables the remote control of various operational parameters.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- Dead end filtration (filter press)
- Tangential filtration (microfilter)
- Characteristic equations of filtration
- Filtration at constant flow rate or pressure
- Displaying the operational parameters of the plant on a schematic diagram with data updating in real time
- Automatic PID control of flow rate and pressure
- Plant supervision

TECHNICAL CHARACTERISTICS:

- Framework of AISI 304 stainless steel with castors
- Feed tank of AISI 304 stainless steel with capacity of 100 l, including stirring system with submersible pump
- Tank of AISI 304 stainless steel for the collection of filtered water with capacity of 100 l
- Feed screw pump with electronic-inverter control system
- Magnetic-induction flowmeter of stainless steel, with 4 to 20 mA output signal,
- 3 electronic pressure transmitters of stainless steel, with 4 to 20 mA output signal
- 2 safety pressure switches
- Filter press of AISI 304 stainless steel with frames of transparent plexiglas
- Microfilter with housing of stainless steel AISI 316
- Electronic turbidimeter with output of 4 to 20 mA
- Digital microprocessor PID controller
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Connecting lines and valves of AISI 304 and 316 stainless steel
- Emergency pushbutton
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from PID controller, real-time trend and historical trend

Dimensions: 1500 x 670 x 1600 mm

Weight: 150 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply: 400 Vca 50 Hz three-phase - 1,5 kVA (Other voltage and frequency on request)
- Tap water (valve with ½" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

FILTER PRESS PILOT PLANT

Mod. FP-2S/EV



INTRODUCTION

This system is equipped with a filter press fed by a variable speed screw pump connected to a tank containing the solution to be filtered. The filtrate passes through a flowmeter and is then collected in another tank. The pump enables to operate at constant pressure and flow rate.

TRAINING PROGRAM

This unit enables an in-depth analysis of the following topics:

- Characteristic equations of filtration
- Filtration at constant flow rate or pressure
- Typical procedures of a filter press (assembly, filtration, disassembly and cleaning)

TECHNICAL SPECIFICATIONS:

- Framework of AISI 304 stainless steel with castors
- Feeding tank of AISI 304 stainless steel, with 100 l capacity, equipped with stirring system driven by submersible pump
- Tank of AISI 304 stainless steel, with 100 l capacity, to collect the filtered water
- Screw feeding pump with speed variator
- Variable area flowmeter for the filtered liquid
- Filter press of AISI 304 stainless steel with transparent Plexiglas frames to display the process
- IP55 switchboard, complying with EC conformity mark, including synoptic diagram and ELCB
- Piping and valves of AISI 304 and AISI 316 stainless steel
- Emergency pushbutton

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)

Dimensions: 1500 x 670 x 1600 mm

Weight: 150 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water floor drain

OPTIONAL

ACCESSORIES

- Portable turbidimeter

SUPPLIED WITH

THEORETICAL – EXPERIMENTAL HANDBOOK



VARIATIONS OF THE PLANT UPON REQUEST

The equipment can be modified upon a specific request of the Customer.

GRAVITY FILTRATION PILOT PLANT

Mod. FTR1c/EV



INTRODUCTION

This filtration plant mainly consists of a sand filter; filtered water is collected into a tank from which samples for proper laboratory analyses can be extracted. An in-line turbidimeter enables to measure the turbidity of water.

Data acquisition is carried out by a specific software.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- mechanical filtration
- main parameters affecting filtration
- influence of feed flow rate on filtration

TECHNICAL CHARACTERISTICS:

- AISI 304 stainless steel framework with castors
- Sand filter of transparent methacrylate, diameter = 100 mm, height = 1000 mm
- Feed tank, 120 l capacity
- Tank for collecting the filtered water, 120 l capacity
- AISI 316 stainless steel magnetic induction flowmeter
- Electronic differential pressure transmitter to measure the pressure drop in the column
- Centrifugal pump with casing and rotor of AISI 304 stainless steel
- Electronic turbidimeter, with programmable range, 4 to 20 mA output signal
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Data acquisition software for Windows

Power supply: 230 Vac 50 Hz single-phase - 1 kVA
(Other voltage and frequency on request)

Dimensions: 2000 x 800 x 2000 mm

Weight: 200 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water (valve with ½" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running a recent version of MS Windows

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

FILTRATION PILOT PLANT

Mod. FTR/EV
Mod. FTRa/EV

manual
automated



INTRODUCTION

This filtration plant mainly consists of a sand filter and of an activated carbon filter; filtered water is collected into a tank of stainless steel from which samples for proper laboratory analyses can be extracted. An in-line turbidimeter enables to measure the turbidity of water flowing in and out of filters. Process control, data acquisition and supervision are automatically carried out by a microprocessor controller and by a specific control and supervision software (only for mod. FTRa/EV) that enables the remote control of various operational parameters.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- mechanical filtration
- chemical filtration
- main parameters affecting filtration
- influence of feed flow rate on filtration
- automatic PID control (only for mod. FTRa/EV)
- plant supervision (only for mod. FTRa/EV)

TECHNICAL CHARACTERISTICS:

Mod. FTR/EV

- Framework of AISI 304 stainless steel with castors
- Sand filter of borosilicate glass with decreasing particle size and capacity of 30 l
- Activated carbon filter of borosilicate glass with capacity of 30 l
- 4 pressure gauges, with range of 0 to 10 m of water column
- Centrifugal pump with casing and rotor of AISI 304 stainless steel and flow-rate of 3000 l/h
- Variable area flowmeter of AISI 304 stainless steel, with range of 100 to 1000 l/h
- Metering pump of plastic material for sodium hypochlorite, with flow rate of 3 l/h
- Metering pump of plastic material for flocculant, with flow-rate of 3 l/h
- 2 feed tanks of AISI 304 stainless steel with capacity of 120 l
- Tank of AISI 304 stainless steel for collecting the filtered water with capacity of 200 l
- Thermoresistance Pt 100 with sheath of AISI 316 stainless steel
- Board-type electronic temperature indicator
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Connecting lines and valves of AISI 304 and 316 stainless steel

Power supply: 230 Vac 50 Hz single-phase - 1,5 kVA
(Other voltage and frequency on request)

Dimensions: 2150 x 750 x 2000 mm

Weight: 460 kg

Mod. FTRa/EV

Besides being provided with all the technical characteristics of mod. FTR/EV, this model also includes the following additional equipment:

- Pneumatic control valve of stainless steel AISI 316 for feed flow rate of water, $C_v = 2.5$
- Electropneumatic converter (4 to 20 A / 0.2 to 1 bar)
- Digital microprocessor PID controller
- Electronic turbidimeter for measuring the turbidity of the water flowing in and out of filters, with programmable range and 4 to 20 mA output signal
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from PID controller, real-time trend and historical trend

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Compressed air (female valve of $\frac{1}{4}$ "): 0.5 Nm³/h @ 6 bar (only for mod. FTRa/EV)
- Tap water (valve with $\frac{1}{2}$ " hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Instrument for water analysis
(e. g.: turbidimeter for mod. FTR/EV)
- Personal Computer running Windows
(only for mod. FTRa/EV)

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

COAGULATION, FLOCCULATION AND SETTLING PILOT PLANT

Mod. FSE/EV **manual**
Mod. FSEa/EV **automated**



INTRODUCTION

Coagulation - flocculation - settling processes are generally used to separate colloids from water, as in this case natural settling speed is too slow to obtain a sufficient clarification.

This plant enables to study the coagulation, flocculation and settling processes separately or simultaneously and it mainly consists of a stirred feed tank, of two tanks for flocculant and coagulant, of a stirred coagulation tank, of a stirred flocculation tank and of a plate settler.

Process control, data acquisition and supervision are automatically carried out by a microprocessor controller and by a specific control and supervision software (only for mod. FSEa/EV) that enables the remote control of various operational parameters.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- coagulation
- flocculation
- co-current and counter-current settling
- characteristics of coagulant and of flocculants
- optimization of coagulation – flocculation and settling processes
- automatic PID control (only for mod. FSEa/EV)
- plant supervision (only for mod. FSEa/EV)

TECHNICAL CHARACTERISTICS:

Mod. FSE/EV

- Framework of AISI 304 stainless steel with castors
- Cylindrical feed tank of transparent methacrylate for the water to be treated with submersible pump and capacity of 300 l
- Feed tank of transparent methacrylate for coagulant with capacity of 60 l
- Feed tank of glass for flocculant, provided with hot-plate magnetic stirrer, with capacity of 0.5 l
- Coagulation reactor of borosilicate glass, equipped with motor-driven stirrer (0 to 300 r.p.m.), with capacity of 30 l
- Flocculation reactor of borosilicate glass, equipped with motor-driven stirrer (0 to 100 r.p.m.), with capacity of 8 l
- Rectangular settler of transparent methacrylate with conical bottom and movable plates for its operation in co-current and counter-current
- Flowmeter of AISI 304 stainless steel for measuring feed flow rate with range of 30 to 300 l/h
- Flowmeter of coagulant feed with range of 2 to 20 l/h
- Feed screw pump with casing and screw of AISI 316 stainless steel and flow rate of 0 to 200 l/h
- Electronic frequency variator for screw pump
- Gear feed pump of AISI 316 stainless steel for coagulant, with flow-rate of 0 to 50 l/h
- Metering pump of flocculant, with flow rate of 0 to 200 ml/h
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB

Dimensions: 1800 x 800 x 2700 mm

Weight: 300 kg

Mod. FSEa/EV

Besides being provided with all the technical characteristics of mod. FSE/EV, this model also includes the following additional equipment:

- Digital microprocessor PID controller, with two control loops
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from PID controller, real-time trend and historical trend

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply: 400 Vca 50 Hz three-phase - 2 kVA (Other voltage and frequency on request)
- Tap water (valve with ½" hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows (only for mod. FSEa/EV)

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.

REVERSE OSMOSIS PILOT PLANT

Mod. OI/EV
Mod. OIa/EV

manual
automated



INTRODUCTION

The phenomenon of osmosis is reversible, consequently, if a solution in contact with a semipermeable membrane undergoes a mechanical pressure higher than its osmotic pressure, some solvent will cross the membrane and this phenomenon is called reverse osmosis.

It can easily be realized that this phenomenon can be used for seawater desalination or to concentrate and purify waste waters.

TRAINING PROGRAM:

The process unit enables to develop and analyze the following issues:

- effect of operating pressure
- effect of feed flow rate
- effect of UV light treatment (sterilization of permeate)
- concentrate and permeate ratio
- optimizing reverse osmosis process
- automatic PID control (only for mod. OIa/EV)
- plant supervision (only for mod. OIa/EV)

TECHNICAL CHARACTERISTICS:

Mod. OI/EV

- Framework of AISI 304 stainless steel with castors
- Feed tank of AISI 316 stainless steel with capacity of 90 l
- Tank of AISI 316 stainless steel for collecting permeate, with capacity of 60 l
- Feed piston pump of AISI 316 stainless steel, including microfilter (5 μ) in suction, with flow rate of 0 to 700 l/h, $P_{max} = 60$ bars
- Magnetic drive gear pump for transferring permeate to UV lamp
- Safety pressure switch
- Osmosis membrane with housing of AISI 316 stainless steel
- Bourdon gauge of AISI 304 stainless steel with range of 0 to 60 bars
- Variable area flowmeter of stainless steel and glass with range of 20 to 200 l/h (only for mod. OI/EV)
- Variable area flowmeter of stainless steel and glass, with range of 80 to 800 l/h (only for mod. OI/EV)
- Variable area flowmeter of stainless steel and glass, with range of 100 to 1000 l/h (only for mod. OI/EV)
- UV lamp for sterilizing permeate
- Microprocessor conductivity meter with sensor of stainless steel and range of 0 to 2000 μ S/cm
- Connecting lines and valves of AISI 304 and 316 stainless steel
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency pushbutton

Dimensions: 1700 x 700 x 2080 mm

Weight: 250 kg

Mod. OIa/EV

Besides being provided with all the technical characteristics of mod. OI/EV, this model also includes the following additional equipment:

- Electronic flow-rate transmitter with range of 0 to 200 l/h and 4 to 20 mA output signal
- Electronic flow-rate transmitter with range of 0 to 600 l/h and 4 to 20 mA output signal
- Electronic flow-rate transmitter with range of 0 to 1000 l/h and 4 to 20 mA output signal
- Electronic pressure transmitter of stainless steel, with range of 0 to 60 bars and 4 to 20 mA output signal
- Pneumatic valve of AISI 316 stainless steel for control of pressure, $C_v = 0.32$
- Pneumatic valve of AISI 316 stainless steel for controlling the discharge flow rate of concentrate, $C_v = 0.2$
- Digital microprocessor PID controller with two control loops
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from PID controller, real-time trend and historical trend

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Power supply: 400 Vca 50 Hz three-phase - 4 kVA (Other voltage and frequency on request)
- Compressed air (female valve of $\frac{1}{4}$ "): 1 Nm³/h @ 6 bars (only for mod. OIa/EV)
- Tap water (valve with $\frac{1}{2}$ " hose connector)
- Water floor drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows (only for mod. OIa/EV)

SUPPLIED WITH

**THEORETICAL – PRACTICAL –
EXPERIMENTAL HANDBOOK**



VARIATIONS OF THE PLANT UPON REQUEST:

This equipment can be modified upon specific request of the Customer.



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ECOLOGY

SOFTWARE

**SUPERVISION SOFTWARE:
PILOT FOR WINDOWS**

SW 3

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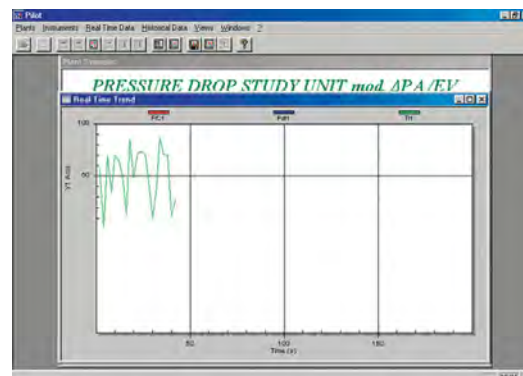
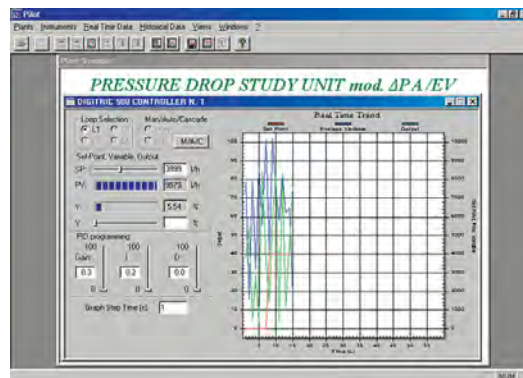
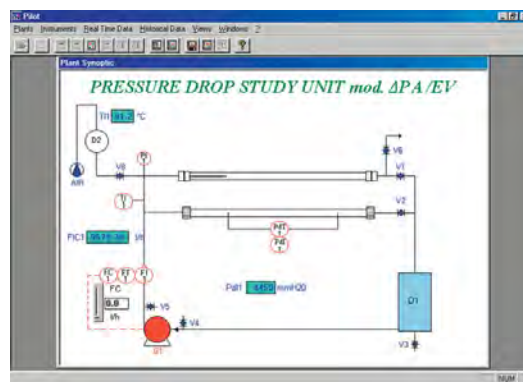
36B-E-SW

SUPERVISION SOFTWARE: PILOT FOR WINDOWS

Each supervision software concerning univocally a specific plant operates in Windows and enables:

- to control ON-OFF signals, that is controlling pumps, compressors, resistors etc... from a PC
- to communicate with the microprocessor PID controller installed on the plant, that is gathering all data coming from the controller and carrying out all the operations being available on instrument display, from a PC
- to display the trend of process parameters in real time
- to display the historical trend of process variables

No card must be inserted into the PC to use this software: just connect the plant with the serial port (COM1 or COM2) of the PC via the serial cable of the equipment.





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SORTED ALPHABETICALLY BY MODEL

ECOLOGY
CATALOGUE N. 36-B

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