



UV00

Computer Controlled and Touch Screen Pilot Plant for the Grape Treatment

12.- FOOD & WATER TECHNOLOGY



(Example of some available units in this catalog)

- Research units, modular and expandable.
- Custom designs and own manufacture.
- Food grade materials.
- Possibility of production for commercialization.

EXPANSIONS

The main reference could be expanded adding:



ESN
EDIBON Scada-Net
Systems



ECL
EDIBON Cloud
Learning

INNOVATE SYSTEMS

- Advanced Real-Time SCADA and PID Control.
- Open Control + Multicontrol + Real-Time Control.
- Specialized EDIBON Control Software based on LabVIEW.
- Calibration exercises, which are included, teach the user how to calibrate a sensor and the importance of checking the accuracy of the sensors before taking measurements.
- Projector and/or electronic whiteboard compatibility allows the unit to be explained and demonstrated to an entire class at one time.
- Capable of doing applied research, real industrial simulation, training courses, etc.
- Remote operation and control by the user and remote control for EDIBON technical support, are always included.
- Totally safe, utilizing 4 safety systems (Mechanical, Electrical, Electronic & Software).
- Designed and manufactured under several quality standards.
- This unit has been designed for future expansion and integration. A common expansion is the EDIBON Scada-Net (ESN) System which enables multiple students to simultaneously operate many units in a network.

WARRANTIES



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For detailed product information, visit:

www.edibon.com



INTRODUCTION

The grape is a fruit consumed in many countries around the world for being a versatile fruit with few complications when it comes to its cultivation. The grape is the name given to the fruit of the vine, used worldwide for its fermentation, which is the main step in the production of grape wine. Although it has other forms of consumption such as fresh fruit, raisins and juices.

There are two main types of grapes, table grapes and wine grapes. The table grape is larger and has a thinner skin. In wine production, a thicker skin is appreciated as it provides aroma and flavor, and a higher sugar content.

The main production process related to grapes is winemaking, in which the must is extracted from the grapes and fermented, so that the sugars in the wine are transformed into ethyl alcohol due to the action of microorganisms. The other two most common grape by-products are grape juice and raisins, which are dried grapes. These grapes can be consumed raw or used in different dishes or pastries, and also help to preserve the grapes while maintaining a large amount of nutrients.

GENERAL DESCRIPTION

The Computer Controlled and Touch Screen Pilot Plant for the Grape Treatment, "UV00", designed by EDIBON, is a pilot plant in which the main production processes related to grapes are carried out.

- **GD/CTS. Computer Controlled and Touch Screen Grape Destemming Unit.** The first step in the treatment of the grapes is the washing and the destemming, a process in which dirt, dust and scrapings are removed from the bunches, as well as a light pressing (a process that is carried out in the destemmer).
- **TMVF. Two Tanks for Maceration, Vattin and Fermentation of Wine.** The next step in the production of wine is the vattin of the must produced during approximately 6 days as the first step of fermentation, this process is not carried out if the final product is juice.
- **HGP/CTS. Computer Controlled and Touch Screen Hydraulic Grape Press.** Subsequently, the product coming from the destemmer is introduced into a press, where a liquid and filtered product is obtained. The use of a press increases the productivity of the process by being able to obtain a greater quantity of liquid that is not retained in the pomace.
- **TERA. Refrigeration or Heating Water Recirculation Unit.** For the elaboration of the juice, after pressing, a conditioning and sterilization process would be carried out before proceeding to its bottling or concentrate. In winemaking, the must obtained after pressing must be stored under controlled conditions, 15 °C and a relative humidity between 60 % and 80 %.
- **EDLC. Computer Controlled Liquid Packaging Teaching Unit.** Storage may be in barrels or directly into the bottle. The "UV00" plant incorporates a bottling machine equipped with a filter to remove any impurities it may contain.

These units are supplied with EDIBON's own designed SCADA + PLCHMI (system composed by an interface including PLC modules such as CPU, digital I/O module, analog I/O module, communication module, etc. and a control box with HMI display) to control the whole process and all the parameters that are involved in the process.

INCLUDED UNITS

PILOT PLANT FOR THE GRAPE TREATMENT

- OPEN CONTROL
+
- MULTICONTROL
+
- REAL TIME CONTROL

UV00. Computer Controlled and Touch Screen Pilot Plant for the Grape Treatment



Grapes



GD/CTS
Computer Controlled
and Touch Screen Grape
Destemming Unit



HCP/CTS
Computer Controlled and
Touch Screen Hydraulic
Grape Press



TMVF
Two Tanks for Maceration,
Vatting and Fermentation
of Wine



TERA
Refrigeration or Heating
Water Recirculation Unit



EDLC
Computer Controlled Liquid
Packaging Teaching Unit



Wine

EXERCISES AND PRACTICAL POSSIBILITIES

Guided practical exercises included in this pilot plant:

- 1.- Study of the grape destemming process.
- 2.- Calculation of the weight of impurities and stems in the grape bunches.
- 3.- Influence of the speed of rotation in the destemming process.
- 4.- Influence of rollers adjustment on grape pressing.
- 5.- Study of the operation of a hydraulic system.
- 6.- Study of grape pressing in a hydraulic press.
- 7.- Study of the influence of the working pressure on the grape pressing.
- 8.- Calculation of the pressing efficiency.
- 9.- Study of the influence of the type of grape on the must yield.
- 10.- Study of wine filtration.
- 11.- Study of the influence of fermentation time on the final product.
- 12.- Study of the influence of fermentation temperature on the final product.
- 13.- Calculation of the alcohol content of wine.
- 14.- Study of the operation of a plate filter.
- 15.- Study of the pressure drop in a plate filter.
- 16.- Study of the bottle filling process.
- 17.- Study of the operation of a by-pass regulation system.
- 18.- Study of the wine maceration process.
- 19.- Study of the wine racking process.
- 20.- Study of the process of vatting, devatting and bleeding of wine.
- 21.- Study of the influence of the maceration temperature on the must.
- 22.- Study of the influence of the vatting temperature on the must.

Additional practical possibilities:

- 23.- Sensors calibration.

Other possibilities to be done with this pilot plant:

- 24.- Many students view results simultaneously.

To view all results in real time in the classroom by means of a projector or an electronic whiteboard.

- 25.- Open Control, Multicontrol and Real Time Control.

Each unit allows intrinsically and/or extrinsically to change the span, gains; proportional, integral, derivative parameters, etc. in real time.

- 26.- Each unit is totally safe as uses mechanical, electrical/electronic, and software safety devices.

- 27.- Each unit can be used for doing applied research.

- 28.- Each unit can be used for giving training courses to Industries even to other Technical Education Institutions.

- 29.- Visualization of all the sensors values used in the UV00 pilot plant process.

- 30.- Several other exercises can be done and designed by the user.

Additional practical possibilities with the expansions:



ESN. EDIBON Scada-Net Systems

- 31.- Control any unit from any post located in the laboratory.
- 32.- Supervise different experiments about data acquisition and representation, from the units, in real time.
- 33.- Visualize any experiment from any laboratory post.
- 34.- Supervise as many experiments as desired, performed in different units at the same time.
- 35.- Generate reports with the results obtained with the units.
- 36.- Perform different experiments at the same time.
- 37.- Show to the laboratory members the appropriate manual or automatic operations to perform with each laboratory unit.
- 38.- Create more elaborate practical exercises using more than one unit from the laboratory.

- 39.- Suggest multidisciplinary experiments, in other words, mix in the same experiment units from different study fields.
- 40.- Modify any parameter of any unit included in the system from any workstation in the laboratory.
- 41.- Cause an abnormal functioning in a unit for the students to practice fault finding exercises.
- 42.- Assess the knowledge of a student or group of students about a particular unit (any unit included in the "ESN" system).
- 43.- Develop guided practical exercises for a better understanding of each unit.
- 44.- Individual training practical exercises.
- 45.- Group exams or practical exercises.
- 46.- Perform interactive exercises (using the chat between manager-users).
- 47.- Exchange of obtained results among the members of the "ESN" system.
- 48.- Any exercise directly related to the SCADA software of each unit.
- 49.- Some of the practical possibilities may be done only with the "ESN" complete system.

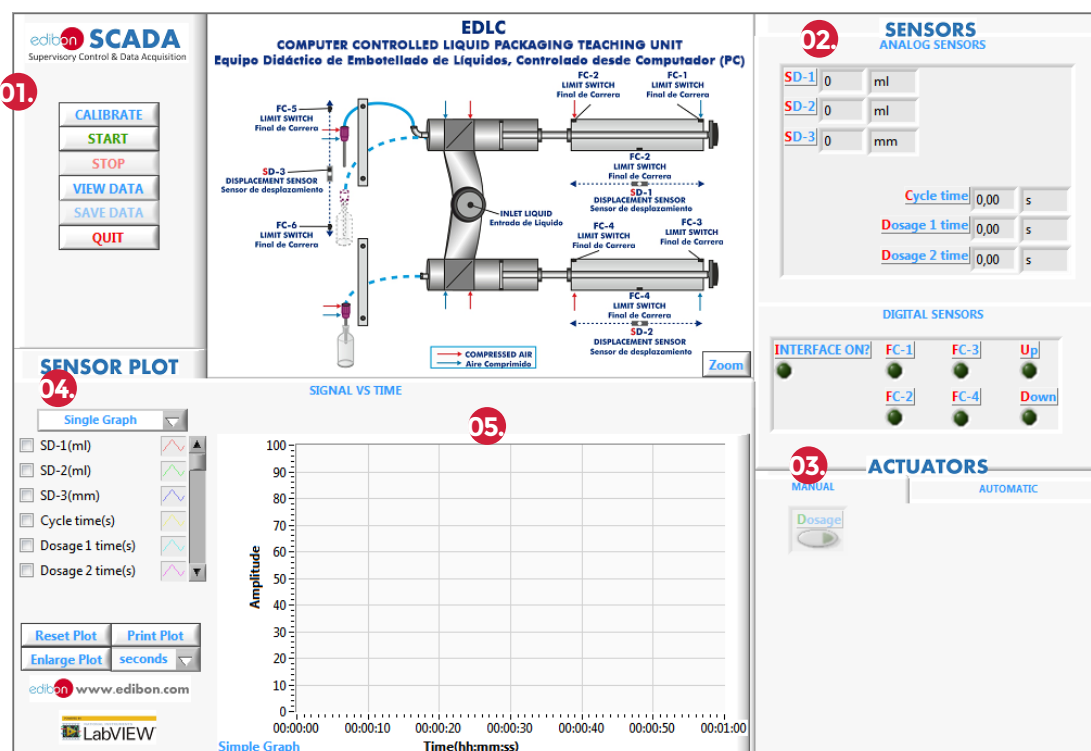


ECL. EDIBON Cloud Learning

**Ask us for information about the practices that you could perform remotely with each of our units.*

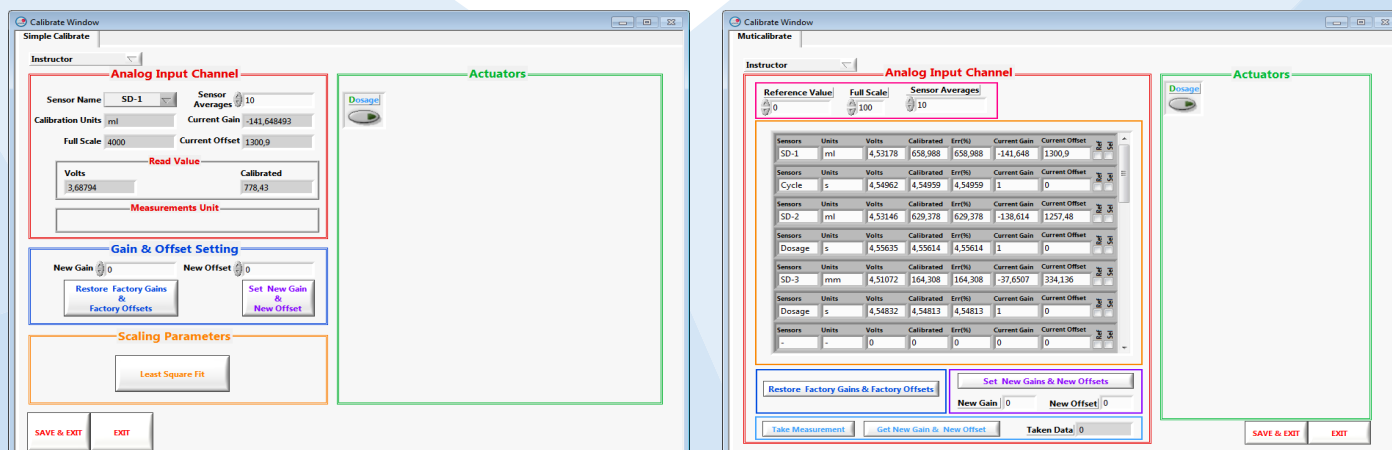
RESULTS

SOFTWARE MAIN SCREEN (Example of one of the unit belonging to UV00)



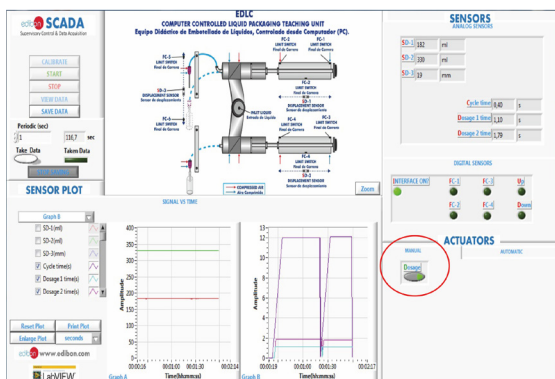
1. Main software operation possibilities.
2. Sensors displays, real time values, and extra output parameters. Sensors: SD=Displacement sensor.
3. Actuators controls. Actuators: Dosage.
4. Channel selection and other plot parameters.
5. Real time graphics displays.

SOFTWARE FOR SENSORS CALIBRATION (Example of screens)



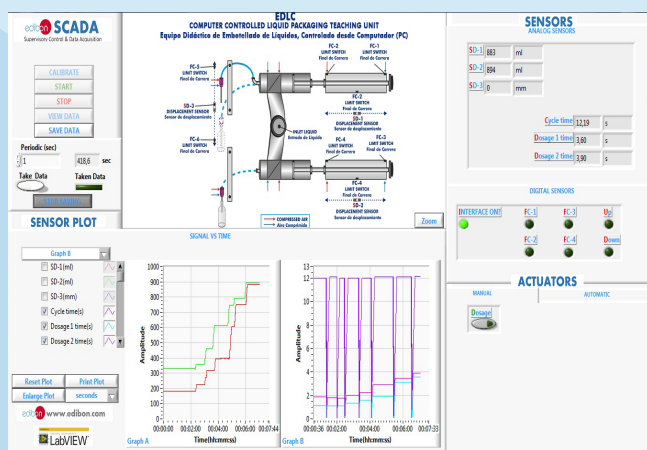
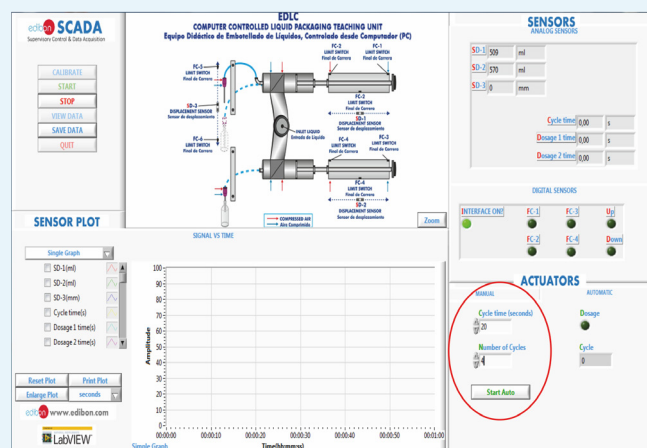
The researcher, the teacher and the students can calibrate the unit with a password provided by EDIBON. Factory calibration can be restored at any time.

RESULTS:



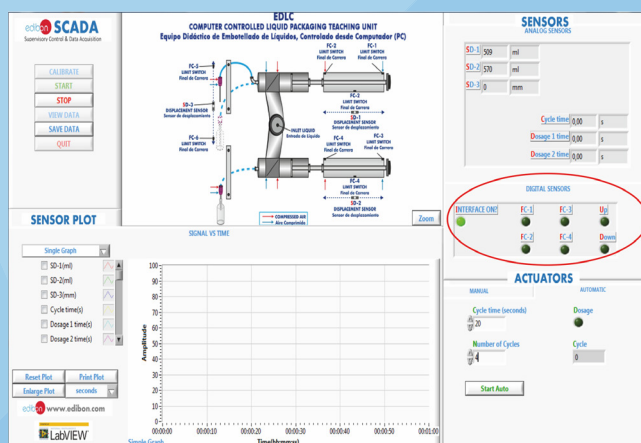
Manual working mode: one dosage per actuator activation.

Automatic working mode: adjustable filling time and number of cycles.



Real time representation of any measured or calculated variable.

The state of the pistons and the dosing nozzles can be identified by the limit switches.



COMPLETE TECHNICAL SPECIFICATIONS**1. UV00 Pilot Plant:**

- This plant includes all the necessary stages for the production of wine.
- Real unit used in wine industry.
- Sensors and actuators which allows the study and understanding of the different processes of grapes products production.
- Modular layout to allow adaptation to different spaces.

**GD/CTS. Computer Controlled and Touch Screen Olive Washing Machine and Leaf Remover.**

- Hourly production: 2500 - 3000 kg/h.
- Total power: 1.8 kW.
- Receiving hopper.
- Feeding auger from the hopper to the destemmer.
- Destemmer with adjustable rubber paddles.
Rotation speed: 520 rpm.
- Rubber rollers for light pressing.
- Screw conveyor for evacuation of pressed grapes.
- Built in AISI 304 stainless steel.
- Electric motor with pulley variator.
- The rollers are adjustable, mobile and tilting.
- The main elements can be removed for easy cleaning.
- Polyethylene basket: 230 x 1000 mm.

**HGP/CTS. Computer Controlled and Touch Screen Hydraulic Grape Press.**

- Maximum pressure: 350 bar.
- Total power: 0.75 kW.
- Stainless steel cage with wooden exterior:
Capacity: 130 kg.
Dimensions: 500 x 650 mm.
- Hydraulic piston:
Diameter: 700 mm.
- Stainless steel receiving vessel
- Hydraulic oil.
- Pressure gauge and automatic pressure adjustment.



TMVF. Two Tanks for Maceration, Vattng and Fermentation of Wine.

- Made of AISI 304 stainless steel.
- Pneumatic kit (with manual pump and pressure gauge).
- Pneumatic float.
- Plastic vacuum pressure valve.
- Stainless steel anti-drip rotary valve 1/2".
- Flat bottom.
- Capacity: 200 l.
- Diameter: 510 mm.
- Height: 1000 mm.
- Stainless steel tripod.
- AISI 304 stainless steel ribbed cooling plates inside.
- Surface area: 0.60 m².
- 1/2" connection thread.
- Dimensions: 1000 x 270 mm.

**TERA. Refrigeration or Heating Water Recirculation Unit.**

- Reversible heat pump:
 - Consumed power: 1.1 kW.
 - Heat capacity: 5.5 kW.
 - Electronic defrost management for operation up to -2 °C. Defrost mode cycle inversion.
 - COP higher than 4.3.
 - Rotary compressor.
- Fan:
 - Power: 50 W.
 - Rotational speed: 770 rpm.
- Exchanger made of titanium.
- Double-pass system to optimize the heat transfer.
- Electronic, ergonomic and discreet control panel to display and adjust the operation parameters of the heat pump easily. Set point temperature setting.
- Refrigerant: R410A.
- Water tank capacity: 140 l approx.
- Level sensor in the tank that prevents the unit from working with a too low water level.
- Centrifugal pump: 0.37 kW; 30 - 80 l/min to 20.1 - 12.8 m.
- Flow control valve.
- Drain valves to drain and clean the water tank.
- Quick release fittings.
- Dimensions: 1100 x 750 x 1100 mm approx.
- Weight: 75 kg approx.



EDLC. Computer Controlled Liquid Packaging Teaching Unit.

- Liquid and semi-dense products dosing machine based on dose delivery through a pneumatically-operated cylinder:

Two cylinders with dosing nozzles with anti-drip system.

Compressed air pressure: 6 - 8 bar.

Dosing accuracy: $\leq 2\%$.

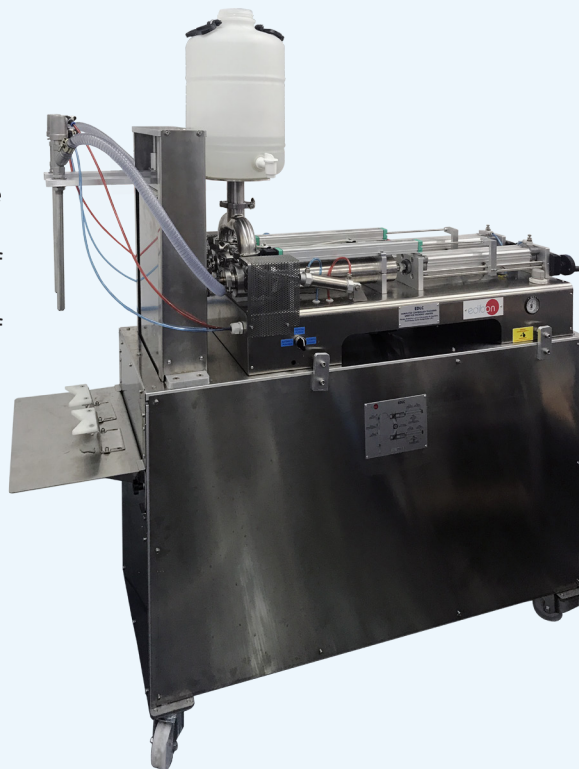
Dose range: 100 - 1000 ml.

Air consumption: 370 l/min.

Approximate production: ≤ 29 dose per minute.

(*) The production will be influenced by the product, the selected dose, the configuration of the machine, etc.

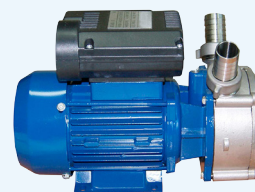
- Air flow regulators to modify the lowering/lifting speed of the dosing nozzles.
- Air flow regulators to modify the closing/opening speed of each dosing nozzle.
- Dose adjusting handle.
- Air flow regulators to modify the speed of each cylinder.
- Supply tank, capacity: 20 l.
- Compressed air filter and regulator.
- Compressed air manometer.
- Eight limit switches.
- Three displacement sensors.
- Manual (with a pedal) or automatic operation mode.
- Safety pushbutton.
- Dimensions: 1200 x 450 x 900 mm approx.
- Weight: 50 kg approx.

**ADDITIONAL RECOMMENDED ELEMENTS (Not included)****For UV00:****TBS. Two Barrels for Storage.**

- Capacity: 225 l.
- Oak wood.
- Head diameter: 560 mm.
- Belly diameter: 690 mm.
- Thickness: 27 mm.
- Support for two barrels.

**TPGV. Transfer Pump for the Grape Vatting Process.**

- Stainless steel.
- Flow rate: 2520 l/h.
- Rotation speed: 1400 rpm.
- Power: 350 W.
- Diameter of suction / impulsion: 25 mm.

**PPLGS. Peristaltic Pump for Liquids with Grape Solids.**

- Flow rate: 150 l/h.
- Destemmed grapes flow rate: 100 l/h.
- Pressure: 4 bar.
- Power: 3 kW.



The complete pilot plant includes as well:

- **Advanced Real-Time SCADA and PID Control.**
- **Open Control + Multicontrol + Real-Time Control.**
- **Specialized EDIBON Control Software based on LabVIEW.**
- **Calibration exercises, which are included, teach the user how to calibrate a sensor and the importance of checking the accuracy of the sensors before taking measurements.**
- **Projector and/or electronic whiteboard compatibility allows the unit to be explained and demonstrated to an entire class at one time.**
- **Capable of doing applied research, real industrial simulation, training courses, etc.**
- **Remote operation and control by the user and remote control for EDIBON technical support, are always included.**
- **Totally safe, utilizing 4 safety systems (Mechanical, Electrical, Electronic & Software).**
- **Designed and manufactured under several quality standards.**
- **This unit has been designed for future expansion and integration. A common expansion is the EDIBON Scada-Net (ESN) System which enables multiple students to simultaneously operate many units in a network.**

2. PLCHMI. IIoT Local/Remote Control and Monitoring with HMI (included):

- The expansion for PLC and HMI, "PLCHMI", is a system composed of an interface that includes PLC modules such as CPU, digital I/O module, analog I/O module, communications module, etc. and a control box with HMI display.

• PLC interface:

PLC controller:

Panasonic FP7 CPS31E CPU.

Digital I/O modules:

16 digital inputs; input range 0 V to 24 V.

16 digital outputs; relay output.

Analogue I/O modules:

16 analog inputs; 16-bit resolution. Input range -10 V to +10 V.

4 analog outputs; 16-bit resolution. Output range -10 V to +10 V.

Connectors and Communication Ports:

2-Port Ethernet Switch.

SCSI connector.

USB, DB-9 Series or DB-25 (if required).

• HMI control box and display:

HMI display:

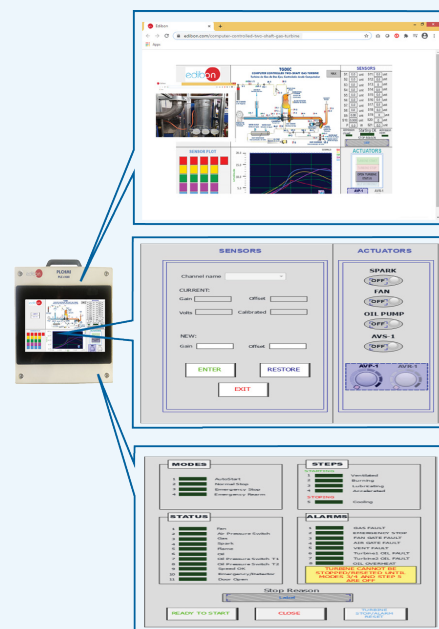
Touch Screen: Analog Resistive.

Size: 10" 16:9 TFT.

Resolution: 1024 x 600, WVGA.

Colors: 64 K.

Ethernet port.



3. UV00/CCSOF. Supervision Software + Control Software + Data Acquisition Software + Data Management Software:

SCADA System is composed of four Software Package with the following features:

- **The Supervision Software** is in charge of monitoring in real time start and stop elements, unexpected conditions and process evolution. In case of being necessary, it actuates on the system and notifies the user the incorrect operations.
- **The Control Software** allows to manage multiple process and variables in real time either a manual way or automatic way. Several type of algorithms of control such PID CONTROL are implemented depending on the field of study.
- **The Data Acquisition Software** focus on measuring and processing signals from the process with very high accuracy getting a synchronized and fast response of the system. A calibration system is part of this software to adjust the sensor measurements.
- **The Data Management Software** stores and represents, alarms, variables and process evolution in real time both in a graphic format and in a numeric format such time charts or process diagram. Printable reports can be generated or historian data can be loaded to study the experiments in detail.

The Software is open and flexible architecture that facilities to access different work levels both instructors and students. It is supported by current Windows operating system and industrial standards. The graphical user interface is intuitive and user- friendly.

4. Cables and Accessories, for normal operation.

5. Manuals:

Each unit is supplied with 8 manuals: Required Services, Assembly and Installation, Interface and Control Software, Starting-up, Safety, Maintenance, Calibration & Practices Manuals.

References 1 to 5 are always included in the minimum supply (according to choice):

- UV00: GD/CTS, HGP/CTS, TMVF, TERA and EDLC.
- PLCHMI.
- UV00/CCSOF.
- Cables and Accessories.
- 8 Manuals for enabling normal and full operation.

REQUIRED SERVICES

- Electrical supply:
 - Single-phase 200 VAC – 240 VAC/50 Hz or 110 VAC – 127 VAC/60 Hz.
 - Three-phase, 380 VAC – 400 VAC/50 Hz or 190 VAC – 240 VAC/60 Hz, 1 kW.
- Water supply and drain.
- Computer.

CONSUMABLES

- **Required (not included)**
 - Grapes.

ELEMENTS

- **Additional recommended (not included)**

For UV00:

 - TBS. Two Barrels for Storage.
 - TPGV. Transfer Pump for the Grape Vatting Process.
 - PPLGS. Peristaltic Pump for Liquids with Grape Solids.

SIMILAR UNITS AVAILABLE

Offered in this catalog:

- UV00. Computer Controlled and Touch Screen Pilot Plant for the Grape Treatment.

Offered in other catalogs:

- CE00. Computer Controlled and Touch Screen Pilot Plants for the Production of Cereals.
- AS00. Computer Controlled and Touch Screen Pilot Plants for the Production of Seeds Oil.
- CA00. Computer Controlled and Touch Screen Pilot Plants for the Production of Meat.
- CI00. Computer Controlled and Touch Screen Pilot Plants for the Production of Citrus Fruits.
- FR00. Computer Controlled and Touch Screen Pilot Plants for the Production of Fruits.
- LE00. Computer Controlled and Touch Screen Pilot Plants for the Production of Dairy Products.
- TO00. Computer Controlled and Touch Screen Pilot Plants for the Production of Tomatoes.
- AC00. Computer Controlled and Touch Screen Pilot Plant for the Production of Oil.
- VE00. Computer Controlled and Touch Screen Pilot Plants for the Production of Vegetables.

Additionally to the main items (1 to 5) described, we can offer, as optional, other items form 6 to 7. All these items try to give more possibilities for:

ESN. EDIBON SCADA-Net System.
ECL. EDIBON Cloud Learning.

EXPANSIONS



6. ESN. EDIBON Scada-Net Systems

The EDIBON Scada-Net Systems, “ESN”, consists on the integration of EDIBON computer controlled units into the SCADA system in a local network.

The main feature of this system is the remote control of any EDIBON unit belonging to it from any control station included in the local network. In addition, any of these units can be visualized from any workstation.

Consequently, the efficiency of a laboratory with the “ESN” system is higher than the efficiency of a conventional laboratory.

- Higher laboratory performance since several students can work simultaneously. Several users can operate various units at the same time.
- Possibility of dividing the classroom into workgroups.
- Several experiments can be performed at the same time.
- Collaborative experiments performance.
- There are different user levels (manager, basic, intermediate and advanced) with different permissions.
- The manager has the absolute control of the system.
- The manager/teacher can supervise from his/her computer the operations every user is performing in any unit of the laboratory.
- Users and manager are connected at all times.
- Real time display and control of the whole system from an interactive whiteboard (touchscreen).
- CENTRALIZED AND SECURE SYSTEM, it can be totally controlled from the central computer (manager).
- The “ESN” System is MODULAR, OPEN and EXPANDIBLE.
- A vision system for real time monitoring of experiments is supplied.
- Visualization of the changes in a unit from any computer of the laboratory.
- All units can work simultaneously.
- The system is made up of as many units as required.
- The required infrastructure, both hardware and software is provided.

For more information see ESN catalog. Click on the following link: www.edibon.com/en/edibon-scada-net



7. ECL. EDIBON Cloud Learning

EDIBON Cloud Learning expansion, “ECL”, is a solution designed to control EDIBON Technology based laboratories remotely in a simple and easy way.

EDIBON Cloud Learning, “ECL”, is divided in two platforms:

Users Online Platform:

The main advantages of the Users Online Platform are:

- The **administrators** have full control over their laboratories thanks to the powerful class-administrator tool that allows the users management, logs visualization and progression monitoring. It also enables to assign users permissions to let them control EDIBON units or just display them. Furthermore, the administrator can upload and download measurements, data and multimedia resources.
- The **users** can learn interactively in a flexible environment as if they were in the laboratory, accessing through the Remote App to work with EDIBON units. Several users can work with one unit or one user with several units. The users can also upload and download measurements, data and graphs, multimedia resources and reports.

Remote App Platform:

Thanks to the Remote App Platform, the users can control EDIBON units and EDIBON SCADA software as if they were in the laboratory and share their expertise with the users community.

For more information see ECR catalog. Click on the following link: www.edibon.com/en/edibon-cloud-learning

ORDER INFORMATION

Main Items (EDIBON recommends the acquisition of all the units for a complete study of the process, although the following could be acquired):

1. UV00. Computer Controlled and Touch Screen Pilot Plant for the Grape Treatment:

Units:

GD/CTS. Computer Controlled and Touch Screen Grape Destemming Unit.

HGP/CTS. Computer Controlled and Touch Screen Hydraulic Grape Press.

TMVF. Two Tanks for Maceration, Vattng and Fermentation of Wine.

TERA. Refrigeration or Heating Water Recirculation Unit.

EDLC. Computer Controlled Liquid Packaging Teaching Unit.

2. PLCHMI. IIoT local/remote Control and Monitoring with HMI.

3. UV00/CCSOF. PID Computer Control + Data Acquisition + Data Management Software.

4. Cables and Accessories, for normal operation.

5. Manuals.

*IMPORTANT: Under UV00 we always supply all the elements for immediate running as 1, 2, 3, 4 and 5.

Optional items (supplied under specific order):

• **EXPANSIONS:**

6. ESN. EDIBON Scada-Net Systems.

7. ECL. EDIBON Cloud Learning.

• **ADDITIONAL RECOMMENDED ELEMENTS:**

For UV00:

TBS. Two Barrels for Storage.

TPGV. Transfer Pump for the Grape Vattng Process.

PPLGS. Peristaltic Pump for Liquids with Grape Solids.

QUALITY CERTIFICATES



WARRANTIES



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REPRESENTATIVE: