

BIOETHANOL PRODUCTION PILOT PLANT

Mod. FER/EV
Mod. FERc/EV
Mod. FERa/EV

manual
manual with data logging
automated

RE

INTRODUCTION

Bioethanol is ethanol obtained from the fermentation of agricultural products and it is mainly used as alternative fuel. This equipment enables to carry out a realistic test of conversion of starch into ethanol through all the phases of this process in a multi-function reactor that can implement liquefaction, saccharification, fermentation and distillation.

TRAINING PROGRAM

This unit enables to deepen the following issues:

- Gelification
- Liquefaction with α -amylase
- Saccharification with glucoamylase
- Fermentation with yeast
- Separation of ethanol by distillation
- Automatic temperature control by PID controller (for mod. FERa/EV, only)
- Plant supervision by P.C. (for mod. FERa/EV, only)



TECHNICAL SPECIFICATIONS:

Mod. FER/EV

- Framework of AISI 304 stainless steel with castors
- Multi-function reactor of AISI 304 stainless steel, with capacity of 13 litres, equipped with:
 - stirrer of AISI 304 stainless steel, with mechanical seal, turning at variable speed
 - baffles
 - sight glass
 - cooling/heating coil
 - insulation with sheet steel
 - thermoresistor Pt100
 - sensor for measuring pH
 - safety valve
- distillation column of borosilicate glass with bubble cap trays and 2 thermoresistances Pt100
- condenser of AISI 304 stainless steel with 2 thermoresistances Pt100
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency button

Mod. FERc/EV

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

- Interface for the connection with a PC included in the switchboard
- Data acquisition software for Windows

Mod. FERa/EV

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

- Pneumatic valve of AISI 316 stainless steel for controlling the flow rate of steam
- Pneumatic valve of AISI 316 stainless steel for controlling the flow rate of cooling water
- 2 electropneumatic converters 4 to 20 mA/ 0.2 to 1 bar
- Microprocessor digital PID controller with serial card
- Supervision software for Windows: it enables to control ON-OFF signals, analog signals coming from 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: 1500 × 700 × 2100 mm

Weight: 130 kg

REQUIRED

UTILITIES (PROVIDED BY THE CUSTOMER)

- Steam: 20 kg/h @ 4.5 bar
- Tap water: 1000 l/h @ 2 bar (valve with ½" hose connector)
- Compressed air (for mod. FERa/EV, only): 1 Nm³/h @ 6 bar (valve with connection of ¼" F)
- Water drain

ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows (for mod. FERc/EV and FERa/EV, only)

SUPPLIED WITH

THEORETICAL – EXPERIMENTAL HANDBOOK



VARIATIONS OF THE PLANT ON REQUEST

The equipment can be modified on request of the Customer.

OPTIONAL

STEAM GENERATOR WITH SOFTENER

mod. SCT04/EV or SCT03/EV