

# HEAT EXCHANGERS APPARATUS

## Mod. HESU/EV



HE

### INTRODUCTION

This equipment consists of a service unit (mod. HES/EV) that supplies the necessary utilities and measuring instruments to carry out tests on five types of heat exchangers: tube-in-tube exchanger (mod. HE1/EV), plate exchanger (mod. HE2/EV), shell-and-tube exchanger (mod. HE3/EV), jacketed tank (mod. HE4/EV) and crossflow exchanger (mod. HE5/EV).

The minimum purchasable configuration includes the service unit (mod. HES/EV) and one of these four exchangers. A data acquisition software with interface system (mod. SI-HE/EV) is available as optional item.

### TRAINING PROGRAM

**This unit enables to deepen the following issues:**

- Heat transfer between fluids separated by a wall
- Energy balance and calculation of efficiency
- Log Mean Temperature Difference (LMTD)
- Overall heat transfer coefficient (U)
- How flow rate and of temperature difference can affect the transfer coefficient
- Comparing the operating modes and performance of different types of heat exchangers

## TECHNICAL SPECIFICATIONS:

### Service unit Mod. HES/EV

- Bench-top framework of AISI 304 stainless steel
- Hot water generator of AISI 304 stainless steel with electronic temperature control, pump, heater of 2 kW and level switch
- Pressure controller of cold water
- 2 electronic flowmeters
- 6 thermoresistances Pt100
- Switchboard of painted carbon steel with ELCB
- All data can be acquired by PC via the optional data acquisition software with interface system (mod. SI-HE/EV)

**Power supply:** 230 Vac 50 Hz single-phase - 3 kVA  
(Other voltage and frequency on request)

**Dimensions:** 850 × 700 × 770 mm

**Weight:** 70 kg



### Tube-in-tube heat exchanger Mod. HE1/EV



- 6 sections of double pipes (outer pipe of transparent Plexiglas, inner pipe of stainless steel)
- Possibility of using 2, 4 or 6 sections to change the total exchange surface (0.027, 0.054 and 0.081 m<sup>2</sup>)
- Pipes can easily be disassembled for cleaning

### Plate-type heat exchanger Mod. HE2/EV

- 10 plates of stainless steel with exchange surface of 0.1 m<sup>2</sup>



### Shell-and-tube heat exchanger Mod. HE3/EV



- Shell of transparent Plexiglas with two baffles
- 7 (removable) inner pipes of stainless steel
- Surface of 0.02 m<sup>2</sup>

### Jacket tank heat exchanger Mod. HE4/EV

- Tank with jacket and coil
- Stirrer of variable speed with baffle



### Crossflow heat exchanger Mod. HE5/EV

- Rectangular duct
- Radiator with fan
- Air speed sensor



### Supervision software with interface Mod. SI-HE/EV

- for Windows
- Synoptic with the values of the measured variables
- Real-time trend
- Historical trend

#### REQUIRED

##### UTILITIES (PROVIDED BY THE CUSTOMER)

- Tap water: 400 l/h @ 2 bar (valve with ½" hose connector)
- Water drain

##### ACCESSORIES (NOT INCLUDED)

- Personal Computer running Windows (for mod. SI-HE/EV, only)

#### SUPPLIED WITH

##### THEORETICAL – EXPERIMENTAL HANDBOOK

