

TRAY DRYER APPARATUS

Mod. TD/EV
Mod. TDc/EV

manual
manual with data logging

DR

INTRODUCTION

This dryer has been designed to study the commonest industrial drying method of solids consisting in blowing a flow of hot air onto some trays where wet material is arranged.

The unit consists of a tunnel equipped with an axial fan at one of its ends. A battery of electric resistors installed after the fan will heat the air flow entering the drying chamber. The chamber with transparent inlet door contains a set of trays suspended on the pan of a balance mounted above the dryer. The total capacity of these trays is of approximately 3.5 kg of solid.

Varying the air speed by an inverter and the power of resistors by a thyristor will enable to vary the temperature of inlet air.

Temperature and relative humidity are measured before and after the drying chamber thanks to two transmitters of temperature/humidity.

The heating elements are completely protected from overheating by a safety switch and they can be switched on only if the fan is turning. Moreover a minimum speed for the fan has been preset.

A digital anemometer will measure the air flow rate.



TRAINING PROGRAM

This unit enables to deepen the following issues:

- Psychrometric chart
- Energy balance
- Mass balance
- Drying regimes
- Analogies between mass and heat transfer
- How air speed and temperature can affect drying

TECHNICAL SPECIFICATIONS:

- Framework of AISI 304 stainless steel with castors
- Horizontal duct of AISI 304 stainless steel with window (450×450 mm)
- Fan with digital speed control, 0 to 4 m/s
- 4 aluminium trays, 400×300 mm
- Adjustable battery of electric heaters, $P_{\max} = 2.7$ kW
- 2 digital thermohygrometers with displays
- Digital anemometer with display
- Electronic balance, with range of 0 to 10 kg, division 0.1 g
- Digital chronometer
- Switchboard IP55, complying with EC conformity mark, including plant synoptic and ELCB
- Emergency button

Power supply: 230 Vac 50 Hz single-phase - 3,1 kVA
(Other voltage and frequency on request)

Dimensions: 1830 × 800 × 1700 mm

Weight: 100 kg

For Mod. TDc/EV only

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

REQUIRED

ACCESSORIES (NOT INCLUDED)

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

SUPPLIED WITH

THEORETICAL – EXPERIMENTAL HANDBOOK

