Air Humidity Measurement Unit

TMHA

Technical Teaching Equipment

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Products
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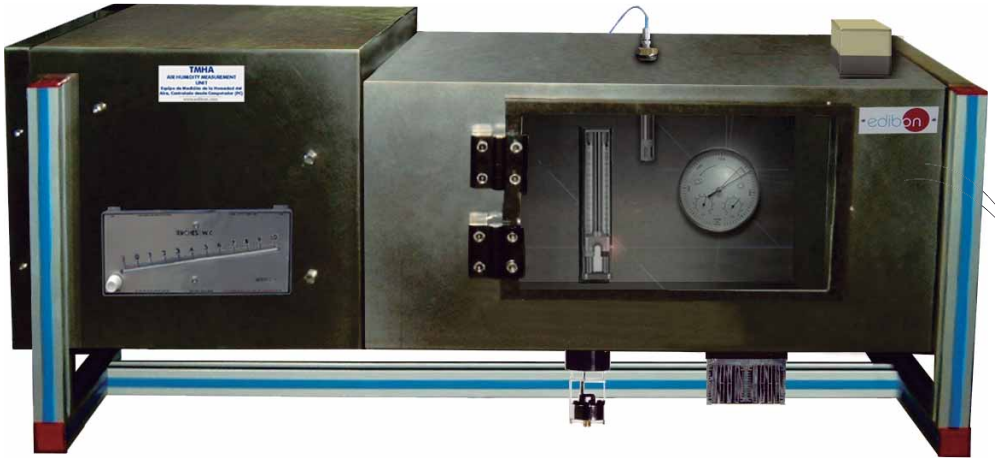
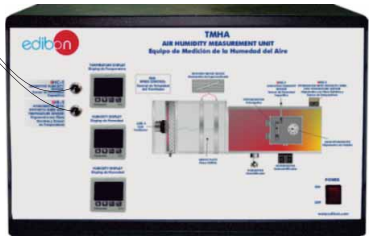
9.-Thermodynamics & Thermotechnics





Electronic console

GENERAL DESCRIPTION

Air humidity is defined as the amount of water vapour in the air. Humidity can be measured in three different ways: absolute, relative and specific. Relative humidity is the percentage between the actual amount of water vapour contained in the air and the amount of water vapour that air should contain to saturate to the same temperature.

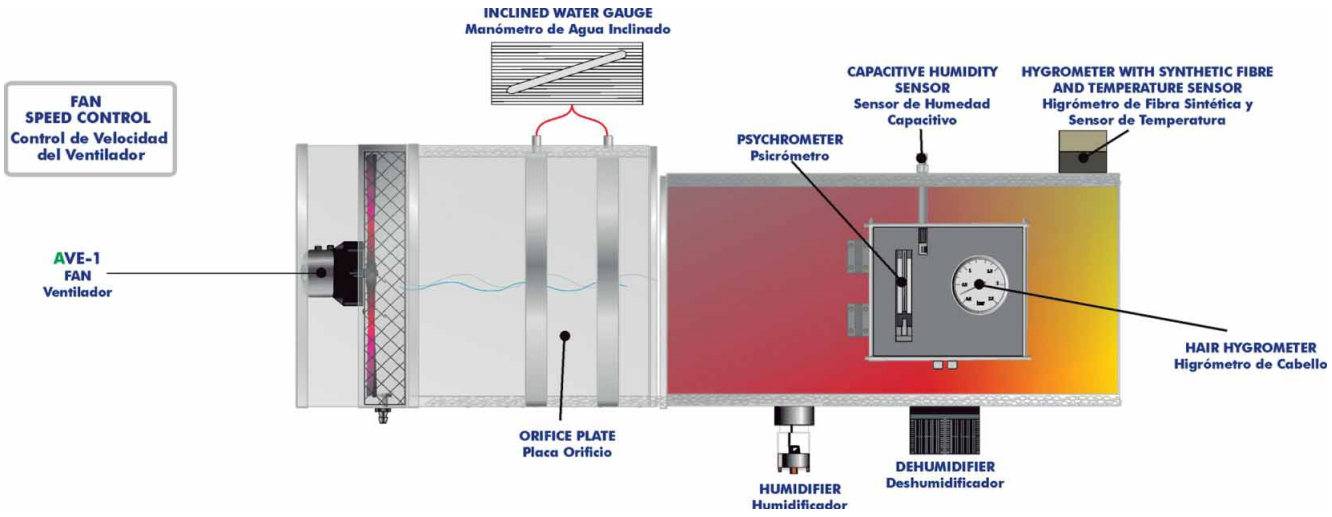
The Air Humidity Measurement Unit (TMHA) enables the measurement of air humidity with different methods and compare them.

A metallic structure holds a stainless steel duct and an electrical fan. The main part is the stainless steel duct that contains instruments to measure the air humidity. Readings are taken through a removable transparent window in the duct. Instruments are changed through that window too. This duct can be humidified and dehumidified. An ultrasonic atomizer is used for humidification and a Peltier cooling element is used for dehumidification.

A fan supplies the duct to show the effects of airflow on different instruments and to ensure a good mixing. The air flow can be varied and the flow rate calculated with the pressure drop produced on the orifice plate located at the fan inlet. That pressure drop can be measured with an inclined water gauge.

The unit includes two hygrometers (with natural hair and with synthetic fibre), one capacitive humidity sensor and a psychrometer.

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9000: Quality Management
(for Design, Manufacturing, Commercialization and After-sales service)

European Union Certificate
(total safety)

Certificates ISO 14000 and
ECO-Management and Audit Scheme
(environmental management)

Worlddidac Quality Charter Certificate
(Worlddidac Member)

SPECIFICATIONS

Anodized aluminium structure.

Diagram with a similar distribution of the elements to that the real unit.

Main metallic elements in stainless steel.

Stainless steel duct with adjustable humidity and a removable transparent window.

The duct includes different elements to adjust the air humidity:

Humidifier: ultrasonic atomizer, power: 22 W approx.

Dehumidifier: Peltier cooling element, cooling capacity: 60 W approx.

Fan to ensure a good mixing and to show the effects of airflow on different instruments.

The air flow can be varied and the flow rate calculated with the pressure drop produced on the orifice plate located at the fan inlet. That pressure drop can be measured with an inclined water gauge.

Measuring methods for air humidity measurement:

A hair hygrometer, range: 0-100% r.h.

A hygrometer with synthetic fibre and combined temperature sensor, range: 0-100% r.h., -30…80°C

A capacitive humidity sensor, range:0-100% r.h.

A psychrometer, range: -20…50°C, graduation: 0.5°C

Electronic console:

Metallic box.

A capacitive humidity sensor connector.

Digital display for the capacitive humidity sensor.

Connector for hygrometer with synthetic fibre and combined temperature sensor.

Two digital displays for the humidity and the temperature for the hygrometer with synthetic fibre and combined temperature sensor.

Cables and accessories, for normal operation.

Manuals: This unit is supplied with the following manuals: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Investigation of different measuring methods for air humidity: hygrometers, capacitive humidity sensor and psychrometer.

2.- Description of air humidity characteristic variables.

3.- Change of the state of air humidity sensor in the h-x diagram.

4.- Demonstration the effect of the fan's flow rate in the humidity measurement.

5.- Determination of the air humidity with: hair hygrometer, hygrometer with synthetic fibre, capacitive humidity sensor and psychrometer.

6.- Comparison of different measuring methods.

REQUIRED SERVICES

- Electrical supply: single phase, 220V/50Hz, 110V/60Hz.

DIMENSIONS & WEIGHTS

TMHA:

Unit:	-Dimensions:	1200 x 450 x 500mm. approx. (47.24 x 17.72 x 19.68 inches approx.)
	-Weight:	90 Kg. approx. (198 pounds approx.)
Electronic console:	-Dimensions:	490 x 330 x 310 mm. approx. (19.29 x12.99 x 12.20 inches approx.)
	-Weight:	10 Kg. approx. (22 pounds approx.)

✱Specifications subject to change without previous notice, due to the convenience of improvements of the product.

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Issue: ED01/13
Date: June/2013

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