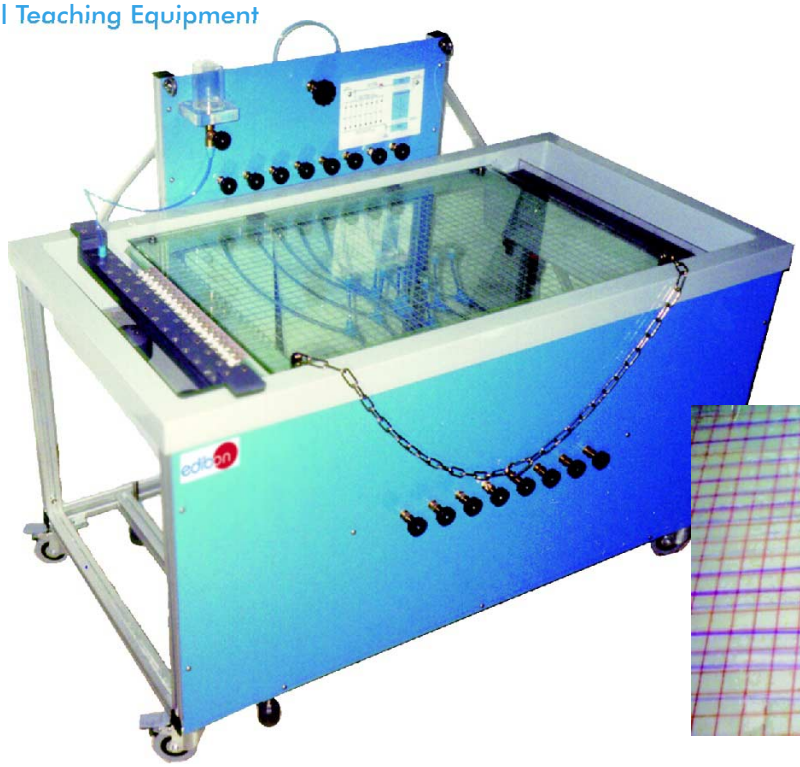
Laminar Flow Visualization and Analysis Unit

LFA

Technical Teaching Equipment



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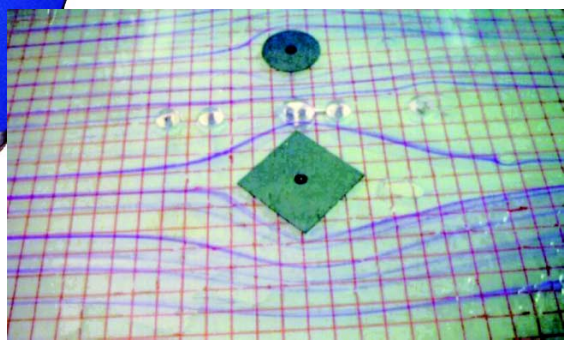
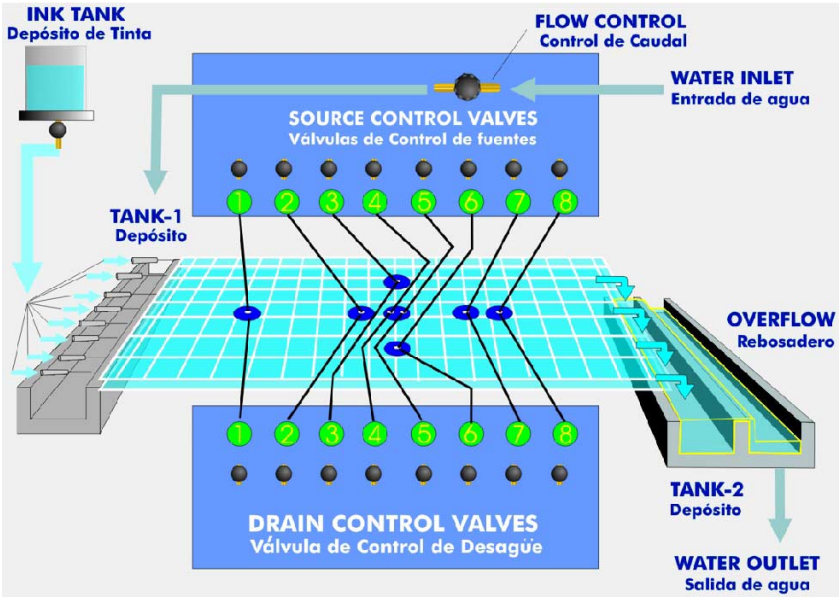


DESCRIPTION

The Laminar Flow Visualization and Analysis Unit allows a complete study of the two-dimensional problems associated with the laminar flow by means of the visualization of the different models of flow that can be visualized with the help of an efficient system of injection of coloured liquid.
It is an amplification of the Hele-Shaw apparatus.
It is a floor standing unit, with a wide work surface to an appropriate height. It has a wide work area that incorporates 8 drains and 8 sources. The work section consists on two glass sheets, separated by means of space bars at a certain distance.
It has a tank at the input and at the output of the work section, besides control valves.
The glass sheets are separated by means of space bars, at a distance that can be adjusted as it is necessary, to achieve an exact study of the laminar flow around different hydrodynamic models. The inferior sheet is grid-printed, to make the flow visualization easier, with eight drains that placed along the central line of the glass sheet in a cross-shape.
It has a tank connected to an injection colouring system that consists on a system of needles placed at he input of glass sheet.

PROCESS DIAGRAM AND ELEMENTS ALLOCATION



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Certificate of Approval

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Certificates ISO 14001: 2004 and
ECO-Management and Audit Scheme
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SPECIFICATIONS

Anodized aluminium structure.
Main metallic elements in stainless steel.
Process diagram in the front panel with similar distribution to the elements in the real unit.
Autonomous Unit that is placed on the floor , equipped with wheels for mobility and with brake to immobilize the unit during the practices.
Laminar flow visualisation table.
Flow visualisation area.
8 sources and 8 drains.
Control valves of the drains and sources.
Input control valves.
Tank of ink.
Manifold of ink.
Draining valve.
Tank at the input and output of the work section.
Grid to facilitate the visualisation of the lines of flow.
The top glass sheet of the visualisation area has handles to be able to lift it with easiness for its correct operation or to install the different hydrodynamic models.
The central drain of the inferior badge, placed in the visualisation area, has a double-shape, that is to say, two orifices in vicinity.
The control systems allow that every, or some, of the drains and sources are fed at the same time.
It is supplied with a coloured liquid injection system, for a better visualization of the lines of flow. It consists on 19 needles, placed among the glass sheets at the input. They are feed from a simple adapter. Through each needle an appropriate quantity of colouring is injected and the direction is visualized with clarity.
It includes a set of hydrodynamic models formed by:

3 circular models: 40, 60 and 80 mm diameter.
3 square models: 40, 60 and 80 mm of length.
1 wing-shape model.

The Unit can be completely purged, opening the emptying valves, placed in the base of the input and output tank.
Manuals:
This unit is **supplied with the following manuals:** Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

Some Practical Possibilities of the Unit:

Ideal flow around submerged bodies:

1.- Ideal flow around a cylinder.
2.- Ideal flow around a surface.
3.- Ideal flow around a body in pick.

Ideal flow in channels and edges:

4.- Ideal flow in a convergent channel.
5.- Ideal flow in a divergent channel.
6.- Ideal flow through a curve of 90º.
7.- Ideal flow through a sudden contraction.
8.- Ideal flow through a sudden broadening.
9.- Substitution of a current line for a solid border.

Ideal flow associated to drains and sources:

10.- Formation of a half-body of Rankine.
11.- Formation of a Rankine oval.
12.- Superposition of drains and sources.

REQUIRED SERVICES

- Water supply.
- Drain next to the unit.

DIMENSIONS & WEIGHT

- Dimensions of the unit: 1600 x 1000 x 1250 mm. approx.
- Dimensions of the work area: 600 x 900 mm.
- Weight: 60 Kg. approx.

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

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