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Technical Teaching Equipment

Mobile Bed and Flow Visualisation Unit

(working section: 2000 x 610 mm)

HVFLM-2

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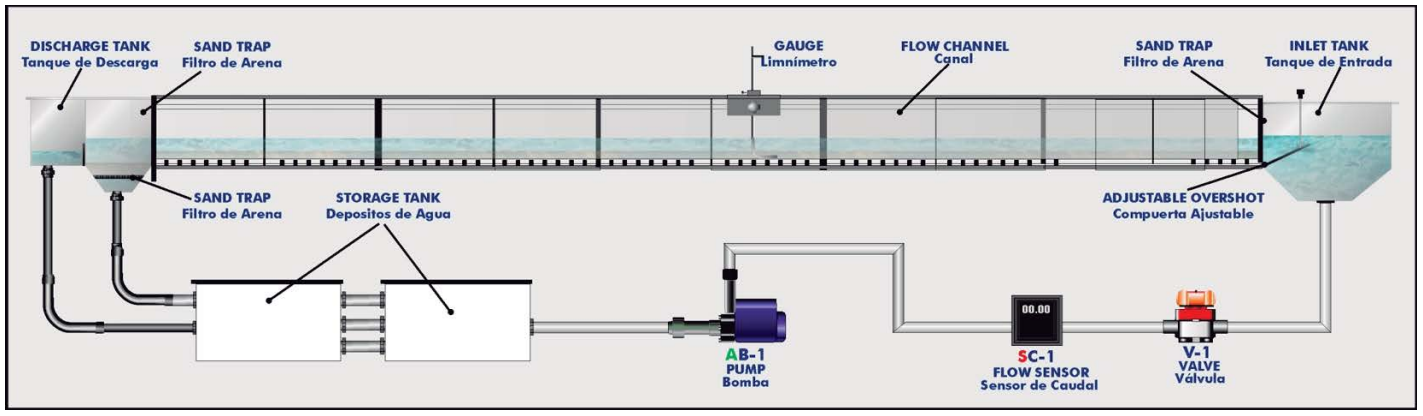
Products
Products range
Units
8.-Fluid Mechanics & Aerodynamics
and
13.-Environment

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 and
Worlddidac Member

GENERAL DESCRIPTION

The Mobile Bed and Flow Visualization Unit (HVFLM-2) is a particularly useful unit to demonstrate the fluidization phenomenon in engineering. It makes it possible to study different situations of flow and mobile bed visualization related to civil engineering structures.

This unit may be used mainly in two study fields. The first one is the investigation of mobile beds, which are related to water courses and civil engineering structures. The second one is related to the visualization of the flow in two dimensions.

The HVFLM-2 unit consists of an horizontal channel through which a current of water flows slowly and at a constant depth. This channel allows to visualize the flow and the mobile bed in two dimensions as it has a large working surface (section: 2000 mm x 610 mmm). The upper part of this surface can be completely visualized during the practical exercises, without the need of assembling any accessory.

The position of different models and structures in the channel, where the flow circulates around them, allows to carry out studies of mobile bed and flow visualization in a simple way.

The unit is self-contained and it consists of an inlet tank with adjustable overshot, a channel with sand traps, a discharge tank, water storage tanks, a centrifugal pump, an electromagnetic flow meter and set of models. The unit includes the necessary instrumentation to measure the water level and the bed depth, formed by an instruments carrier and a gauge.

The practical exercises with this unit are carried out by using water and sand. Ink is included for the two dimension flow visualization, to carry out flow studies around the models and to demonstrate the boundary layer.

Set of models included

Bridge piers models

2 rectangular models

4 cylindrical models

4 square models

2 profiled rectangular models

2 rectangular models with rounded ends

Triangular model

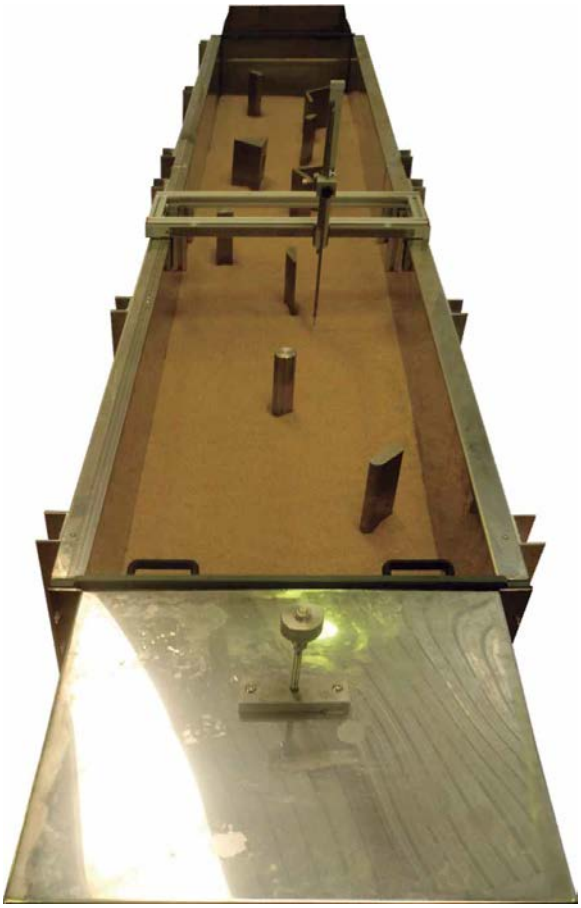
Asymmetrical aerofoil model

Six baffles to direct the water flow during the experimental tests

A set of 12 "L" shaped profiles

Three pairs of different angles to build additional models

Some detail pictures



SPECIFICATIONS

The Mobile Bed and Flow Visualization Unit (HVFLM-2) is mounted on a metallic structure with wheels, rigid and resistance enough to support the weight of water and sand without suffering any deformation. All components in contact with water are of non-corrosive materials. The unit includes a diagram with similar distribution to the elements in the real unit.

This unit is divided into three sections: inlet tank, working section (channel) and discharge tank. These sections are assembled through joints in order to get a complete assembly.

Stainless steel inlet tank, with adjustable hermetic overshot. It is supplied with a control at the upper side of the tank which makes it possible to change the slope of such overshot. The tank includes two perforated distributors and a perforated plate to spread the flow evenly across the width of the tank. Inlet tank dimensions: 530 mm x 710 mm x 530 mm.

Flow channel, made of stainless steel, including two main rails along the working section with millimeter rulers (longitudinal crosspiece). An instruments carrier which has a sub-rail (transverse crosspiece) is supported on the rails and allow to put a gauge. Two sand traps can be coupled to both ends of the working section. Dimensions: 2000 mm x 710mm x 350 mm. The working section is 2000mm x 610 mm, and max. water depth is 120 mm. approx.

Discharge tank, made of stainless steel, with overflow. It is divided into two parts, the one closer to the channel enables the sedimentation of sand, using a trap, whereas the second part enables the removal of the water which overflows from the first part. Discharge tank dimensions: 850 mm x 710 mm x 530 mm.

Instrumentation:

An instruments carrier, which can be positioned over any point of the working section.

A gauge designed to be mounted on the instruments carrier. It is provided with a stainless steel hook and a point, and a Vernier scale.

The practical exercises with this unit are carried out by using water and sand. Ink is included for the two dimension flow visualization, to carry out flow studies around the models and to demonstrate the boundary layer, without the need of assembling any accessory.

Two water storage tanks, made of polyethylene, of approximately 250 l. each one. It has a filter at the pump inlet to retain possible residues, a butterfly valve and an overflow that connects the storage tanks.

Centrifugal pump with flow regulation: flow range: 7.2 - 18 m^3/h; height: 14.4 -19.70 M.W.C.

Electromagnetic flow meter with display for the measurement and the reading of the flow, flow range: 0.16 - 16.6 l./s.

Membrane valve.

Two different size gates to simulate an overflow and an obstacle in the working section.

The traps of the working section, the discharge tank and the supply tanks are movable elements than can be used to retain sand and solids in the working section. They can also be removed to adjust the channel to different working conditions.

A set of models included:

Bridge piers models:

2 rectangular models.

4 cylindrical models.

4 square models.

2 profiled rectangular models.

2 rectangular models with rounded ends.

Triangular model.

Asymmetrical aerofoil model.

Six baffles to direct the water flow during the experimental tests.

A set of 12 "L" shaped profiles.

Three pairs of different angles to build additional models

Electronic console, including:

Motor-pump starter for the centrifugal pump.

Flow controller for the centrifugal pump.

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.

A wide range of optional models available (see next page, section: "optional models").

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Observation of the flow around model engineering structures.

2.- Mobile bed experiments.

3.- Study of the meandering water courses characteristics.

4.- Visualization of the behaviour of boundary layers.

5.- Demonstration of boundary layer suction.

6.- Studies of erosion.

7.- Studies of deposition.

8.- Studies of velocity distribution in duct flow.

9.- Studies with engineering structures.

10.-Two dimensional flow visualization.

11.-Study of the hydraulic analogy to compressible flow.

REQUIRED SERVICES

- Electrical supply: 220V./50Hz or 110V./60Hz.
- Water supply and drainage.
- Sand bed: grain size: 0.4 - 0.8 mm. Sand bed thickness: 60 mm approximately.

DIMENSIONS & WEIGHT

- Dimensions: 3350 x 710 x 1200 mm. approx.
  (131.89 x 27.95 x 47.24 inches approx.).
- Weight: 550 Kg. approx.
  (1212.54 pounds approx.).

OPTIONAL MODELS

- Float.
- Tank strips.
- Cylinder 90° angle walls.
- Irrotational bend model.
- Two side wall meanders.
- Two bell mouth entries (right and left hand).
- Vibration of a cylinder and box.
- Weight.
- Retaining block.

AVAILABLE VERSIONS

Offered in this catalogue:

- HVFLM-2. Mobile Bed and Flow Visualisation Unit (working section: 2000 x 610 mm).

Offered in other catalogue:

- HVFLM-4. Mobile Bed and Flow Visualisation Unit (working section: 4000 x 610 mm).

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

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REPRESENTATIVE: