

Practical work 4: Water head and velocity measurement along the channel

1. Objective:

The objective of this practical exercise is to measure the average head and velocity along the channel for different flow rates and slopes of the bottom. Thus, the student can analyze the evolution of the free surface profile

2. Description of the unit

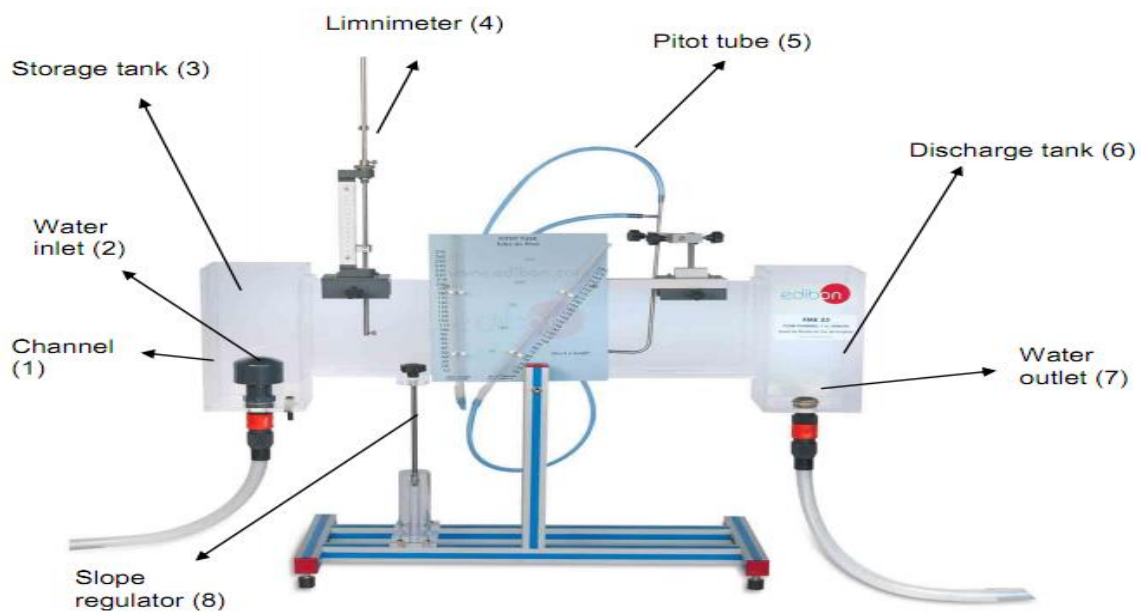


Figure 1: Experiment bench for flow in channels. General view

The experimental unit consists of a 1-meter-long rectangular channel with transparent PMMA walls, allowing water to flow smoothly. Water enters the channel through a specially designed inlet to prevent splashing, aided by a storage tank that ensures a controlled flow. The water level is measured using a limnimeter, while a Pitot tube measures the flow velocity (both accessories recommended but not included). After passing through the channel, water collects in a discharge tank and is returned to the hydraulic bench via a flexible outlet pipe. The slope of the channel can be adjusted using a worm gear slope regulator to vary flow conditions.

3. Experimental procedure

Before starting the experiments:

- Check that the FME00 tank is filled with clean water.
- Put the channel in horizontal position and check that there is no obstacle or accessory in the channel.
- Check that the pipe of the storage tank discharges into the bench correctly.

Once checked, proceed to:

- Establish the place where the water depth and the average velocity of the current will be measured. If the limnimeter and the Pitot tube are used, always locate them in the same place to compare the results.
- Set a working flow with the VCC-1 valve and record the value (the way to measure the flow is indicated in the operation section).

