

# FLOW MEASUREMENT IN OPEN WATER PIPES



## REFERENCE : MP62

This bench of studies makes it possible to know the different methods of measurement of the flows in open conduits by triangular weirs, or rectangular, venturi and limnometric measurements or by ultrasonic sensor.

The differences in water height generated by the passage of water through standardized construction pressure units will be measured. Depending on the geometric characteristics of these organs, the calculation of flow rates is then possible. The ultrasonic sensor (option) allows direct access to the flow measurement by programming it.

### Technical specifications :

*Non contractual photo*

**SERVICE : POWER SUPPLY: 220 V SINGLE  
PHASE CONSUMPTION: LESS THAN 0.75  
KW  
DIMENSIONS : 3.25 X 0.8 X 1.9 MM**

**WEIGHT : 250 KG**

**One channel** : useful dimensions : L x W x D: 2400 x 100 x 180 mm in Altuglas  
A stabilizing basin upstream of the circuit with a safety device and safety weir,  
A graduated drain pan for flow measurement at low flows.

This tank is followed by another tank allowing the return of the flow to the pump, either by two drowned pipes, or by two partially denuded pipes,  
- A feed tray  
- A float flowmeter  
- A stainless steel centrifugal pump whose flow rate can be adjusted either by a diaphragm valve or by a variable speed drive. This flow can be checked using the float flowmeter.

Two gauges allowing the survey of the water line in the canal. They will be moved along the canal depending on the weirs,  
The measuring bench is mounted on a stainless steel frame.  
The IP55 control cabinet includes the pump control, its dimmer, the sensor display, circuit breakers, fuses, on / off, emergency stop.

### Possibilities of the device :

**The elements mentioned above make it possible to visualize and to characterize :**

- Uniform and permanent flows,
- The gradually varying flows (fluvial and torrential with transition from one to the other),
- Weirs and venturi flow measurements,
- The evacuation of floods by siphon.
- For the triangular and rectangular weirs, with the limnometric heights and applying the formulas we will try to find the flows. These flow rates can be measured with the graduated tank located downstream of the channel by timing.
- The ultrasonic transmitter will be programmed by taking the curve  $h = f(Q)$  point by point and checking the reliability of the measurement.
- With the venturi, higher flow rates can be measured (up to 15 m<sup>3</sup> / h), all measurement torques (h, Q) will also be recorded in order to program the calibration curve of the measuring element. For a downstream water level, and therefore a water flow declared as a set

point on the drive controller, the integrated PI regulator will be used to regulate the speed of the pump in response to a pressure drop disturbance in the pump. the channel supply circuit corresponding to the opening or closing of the diaphragm valve located at the discharge of the pump.

### **OPTIONS :**

Option 1. Spillway: thin-walled without lateral contraction and overflow threshold  
Option 2. Thick Threshold, Nerpic Threshold, Venturi  
Option 3. Channel tilt system  
Option 4. Electronic flow meter  
Option 5. Pump flow regulation  
Option 6. Ultrasonic Sensor and Transmitter: An ultrasonic level measurement detector placed above the channel with direct flow display by extraction of the square root. This sensor has a 4-20 mA output  
Option 7. Sampler.