



Free and Forced Vortex Apparatus (SMT-FM-13)

This ESOLS Product of Fluid Mechanics related labs used to study both free and forced vortices, and measure the vortex water surface profile. A vortex is a circular flow of a fluid caused by sufficiently large velocity gradients. In practice, this can be observed when water flows out of a basin into a pipe or when two fluids with different speeds meet each other.

The apparatus has a transparent tank with nozzles, various inserts on the water drain, an impeller and a point gauge for detecting the vortex profiles. To form the free vortex, water is introduced radially into the tank and flows through a ring to slow down. The vortex is created by the flow out of the tank. There are four easily replaceable inserts of various diameters available for the drain.

To form a forced vortex, the water is introduced tangentially. The vortex is generated via an impeller driven by a water jet. The point gauges are used to measure the surface profiles of the vortices. The speed of the vortex is also determined.

This unit can be operated by Laboratory supply of with any Hydraulic Bench.

TECHNICAL SPECIFICATIONS

Specifications:

- Transparent PMMA tank allows visualisation of vortex formation
- Two nozzles for radial water supply (free vortex) and two nozzles for tangential water supply (forced vortex)
- Different inserts for the water drain to generate free vortex
- Has Impeller for generating a forced vortex
- Point gauges detect the surface profile
- Flow rate determined by SMT-FM-100 base module.
- Water supply using SMT-FM-100 base module.
- Supplied with a comprehensive user guide.



Technical Data:

- Tank
 - Material: PMMA
 - diameter: 250mm
 - height: 200mm
- 4 inserts for the water drain
 - diameter: 8, 12, 16 and 24mm

Impeller with 3 blades

Vertical point gauge

- 6 movable rods

- Horizontal point gauge

- 2 movable rods

- Measuring tube, movable

- horizontal 0...90mm, vertical 70...190mm
- diameter: 4mm

- LxWxH: 650x450x650mm.

- Weight: approx. 17kg.

- Accessories (Included)

- All necessary Flexible pipes and fittings.
- Instruction Manual

- Operating Conditions

- Laboratory Temperature: 5°C to 40°C

- Note:

This product may produce small splashes of water in use, so you must use it at a safe distance from electrical supplies. ESOLS recommends approximately 2.0 m.

Experimental Data:

- Visualization of the surface profile of a free and forced vortex
- Determination of the total head variation in a forced vortex
- Representation of surface profiles
- Determination of velocity
- Comparison of results with theoretical predictions