

**Product Name :**  
Astra Scientific Pipe Surge and Water Hammer Apparatus

**Product Code :**  
Fluid Mechanics Lab0029



**Description :**

Astra Scientific Pipe Surge and Water Hammer Apparatus

**Technical Specification :**

**DESCRIPTION:**

The Advanced designed equipment is freestanding and comprises two stainless Steel test pipes connected to a constant head tank with the Necessary connections to an Hydraulics Bench. Pipe surge demonstrations are conducted using the first test pipe, which incorporates a transparent surge shaft, and lever operated valve at the discharge end. An additional Valve downstream allows the flow through the test pipe to be varied before closing the lever operated valve. A scale on the surge shaft allows the low speed transients in water level to be measured.

Water hammer demonstrations are conducted using the second test pipe, which incorporates a fast acting valve at the discharge end. An additional valve downstream allows the flow through the test pipe to be varied before closing the fast acting valve. The unique fast acting valve, specifically designed by

“SUNLABTECH” allows water hammer to be generated in a relatively short length of straight pipe because of the extremely short closure time achieved using a trigger actuator.

Tapping's incorporating electronic pressure sensors are located in the test pipe adjacent to the fast acting valve and half way along the test pipe. These sensors measure the high-speed pressure transients inside the pipe as the water hammer travels backwards and forwards along the test pipe. The time delay between the sensors can be used to determine the speed of sound through the water that is attenuated by the elasticity of the metal pipe wall.

#### **FEATURES:**

- Demonstration of pipe surge resulting from slow deceleration of flow in a pipe
- Determination of the oscillatory characteristics of a surge
- Shaft used to attenuate pipe surge
- Measuring the pressure profile characteristics associated with water hammer associated with rapid deceleration of flow in a pipe
- Comparison between theoretical and measured Pressure profiles associated with water hammer
- Determination of the velocity of sound through a fluid in an elastic pipe

#### **SPECIFICATIONS:**

- Test pipes: Stainless steel, 20.2 mm inside diameter,
- Test pipe length: 3 m long
- Surge shaft clear acrylic, 40 mm inside diameter, 800 mm high
- Head tank PVC, capacity 45 liters



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