



Fluid Mechanics

H4

Flow Through an Orifice

Shows flow through different orifices for different flow rates



Optional Set of Orifices (H4a)

- Direct measurement of total head, head loss and diameter of jet
- Vertical water jet
- Integral Pitot traverse tube
- Sharp-edged orifice included
- Sets of additional interchangeable orifices available (H4a)
- Works with TecEquipment's gravimetric or volumetric hydraulic benches for easy installation

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- An ISO 9001 certified company

H4

Flow Through an Orifice

Description

TecEquipment's Flow through an Orifice apparatus allows students to measure:

- Decrease in flow
- Contraction of the stream
- Energy loss

They find these measurements as water leaves an orifice. Students can also use the apparatus to study different shapes of orifice (extra orifices are available separately).

The apparatus works with either of TecEquipment's hydraulic benches (H1 or H1D, available separately) and stands on the hydraulic bench worktop. The equipment has a transparent cylindrical tank, with a mounting in the base for different orifices. TecEquipment supplies the apparatus with a sharp-edged orifice already mounted.

Water flows into the tank from the hydraulic bench through an adjustable diffuser. The flow rate and an overflow pipe set the water level. To change the level in the tank (and so the head on the orifice), students adjust the flow to the diffuser. Water leaves the tank through the orifice. The jet that leaves the orifice discharges into the hydraulic bench measuring tank.

Manometers measure the total head on the orifice and under the jet. A traverse assembly holds a Pitot tube which students can position anywhere in the jet. A sharp blade accurately measures the jet diameter. This allows students to find the contraction coefficient.

Standard Features

- Supplied with a comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

Essential Base Unit

- Gravimetric Hydraulic Bench (H1) **or**
- Volumetric Hydraulic Bench (H1D)

Recommended Ancillaries

- Set of Orifices (H4a) – A set of four circular orifices (nozzles), each with the same minimum throat diameter but with different length. Each has different approach and discharge section. Additional square and triangular orifice.

Essential Services

Water supply: From the Hydraulic Bench (H1 or H1D)

Experiments

Investigations into a variety of orifices over a range of flow rates, including:

- Determination of contraction and velocity coefficients
- Calculation of discharge coefficient
- Determination of actual discharge coefficient, and comparison with calculated values
- Determination of the various coefficients over a range of flow rates to show the influence of Reynolds number
- Study of the characteristics of different orifices (needs ancillary products H4a)

Operating Conditions

Operating environment: Laboratory

Storage temperature range: -25°C to $+55^{\circ}\text{C}$ (when packed for transport)

Operating temperature range: $+5^{\circ}\text{C}$ to $+40^{\circ}\text{C}$

Specification

H4

Nett dimensions: 720 mm x 520 mm x 470 mm

Packed dimensions and weight: 0.18 m³ and 15 kg

Maximum head: 365 mm

Maximum flow rate: Nominally 13 litres per minute

Operating relative humidity range: 80% at temperatures $< 31^{\circ}\text{C}$ decreasing linearly to 50% at 40°C

H4a

Packed dimensions and weight: 0.046 m³ and 4 kg

Circular orifice dimensions:

- Length 13 mm, with 60° contraction and 60° diverging section
- Length 13 mm, with 29 mm diameter bell-mouth approach to 60° diverging section
- Length 60 mm, with 29 mm diameter bell-mouth approach to 51 mm long parallel section
- Length 60 mm, with 29 mm diameter bell-mouth approach, to 30° diverging section and 25 mm long parallel section

Triangular orifice dimensions: Each side nominally 12.1 mm, including 1.5 mm corner radius

Square orifice dimensions: Each side 9 mm

Orifice material: Aluminium

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Furthermore infoWERK is the representative and system integrator of "TecQuipment".

TecQuipment is one of the global leaders in technical teaching equipment for engineering. If you are interested in one of TecQuipment's products feel free to contact us at:



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