

≡ FLOW THROUGH AN ORIFICE

HDMS H4

A cylindrical tank with an adjustable diffuser that demonstrates flow through different orifices for different flow rates.



SCREENSHOT OF THE HDMS SOFTWARE



SHOWN WITH TECQUIPMENT'S DIGITAL HYDRAULIC BENCH (H1F) - AVAILABLE SEPARATELY

KEY FEATURES

- Direct measurement of total head, head loss and diameter of a vertical water jet
- Integral Pitot traverse with blade to measure head in the jet and diameter of jet
- Includes a sharp-edged circular, triangular and square orifices. Also converging/diverging, angled entrance and exit, curved entrance (parallel throat) nozzles
- Works with TecEquipment's Digital Hydraulic Bench (H1F)* for easy installation
- Works with TecEquipment's optional, free Hydraulics Data Management System Software (HDMS)

KEY SPECIFICATIONS

- Includes 13 mm diameter sharp-edged orifice
- Integral Pitot traverse
- Study of the characteristics of different orifices

LEARNING OUTCOMES

- 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 demonstrate the influence of Reynolds number
- Study of the characteristics of different orifices, using a set of four circular orifices (nozzles). Each has the same minimum throat diameter but a different length. Each has a different approach and discharge section. Also included are additional square and triangular orifices.

≡ FLOW THROUGH AN ORIFICE

HDMS H4

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.

The apparatus works with TecEquipment's Digital Hydraulic Bench (H1F, 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 from the hydraulic bench and into the cylindrical tank 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 back into the hydraulic bench.

A Pitot assembly holds a sharp blade and a Pitot tube which students can position anywhere in the jet. The blade accurately measures the jet diameter, to allow students to find the contraction coefficient.

Manometers connect to the Pitot tube and a tapping in the base of the cylindrical tank to measure the total head on the orifice and in the jet.

If required students can download TecEquipment's Hydraulics Data Management System (HDMS) software onto a suitable computer (not supplied) to aid with entering, evaluating and presenting their data.



SET OF ORIFICES

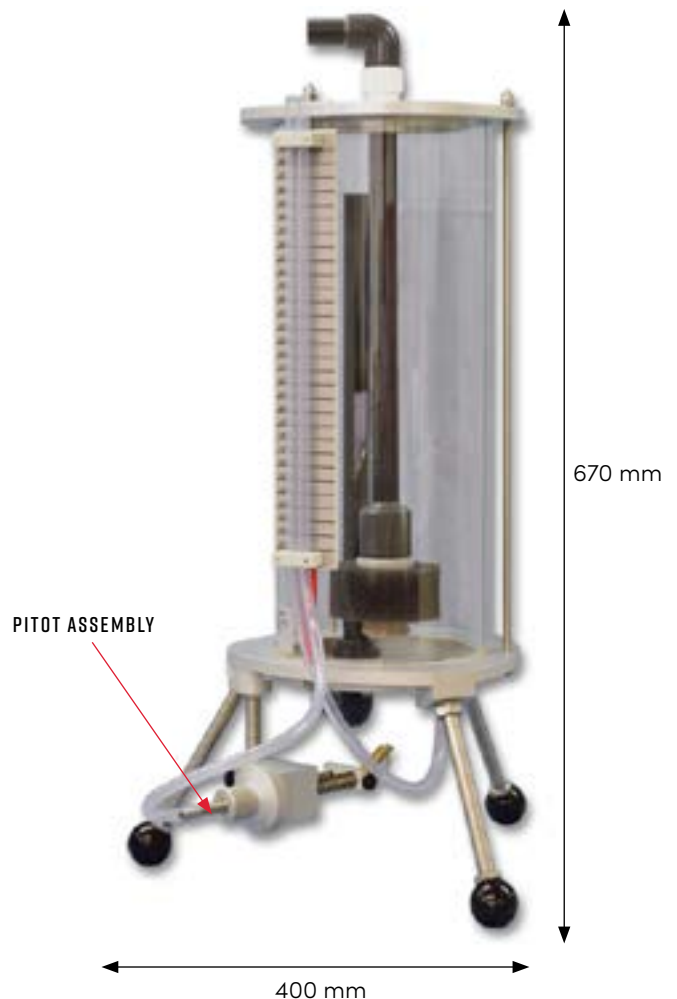
STANDARD FEATURES

- Supplied with a comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives
- ISO9001 certified manufacturer
- Set of six orifices: 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 BASE UNIT

- Digital Hydraulic Bench (H1F)*

*This product will also work with existing TecEquipment Gravimetric and Volumetric Hydraulic Benches (H1 and H1D)



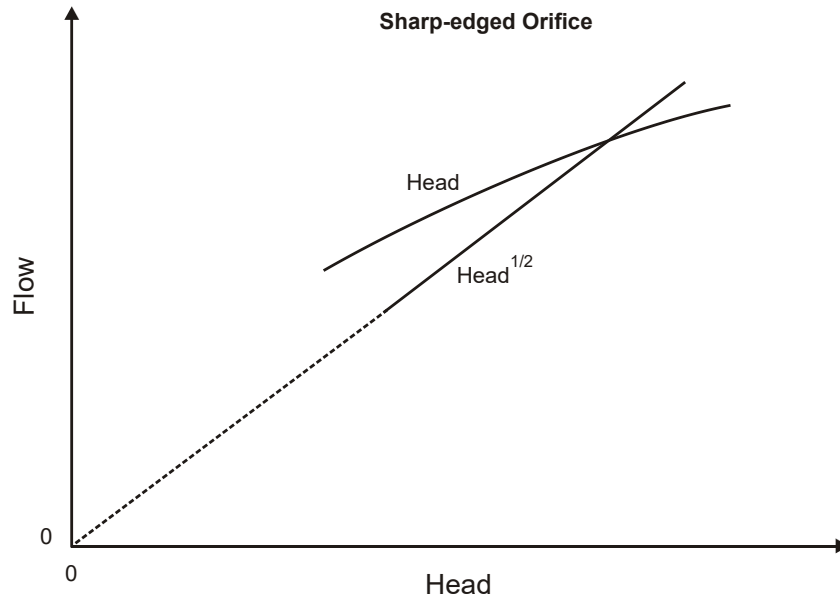
≡ FLOW THROUGH AN ORIFICE

HDMS H4

TYPICAL WORK ASSIGNMENT

HEAD AND FLOW RELATIONSHIPS

This experiment tests the relationship between head of water above the orifice and flow. The results produce charts of head and flow. They also produce the coefficient of discharge for the orifice over a range of flow.



HYDRAULICS DATA MANAGEMENT SYSTEM

The HDMS is a complementary software tool designed to help students accurately record data from experiments associated with this apparatus. The software is intuitive and easy to use, with clear and convenient data display options, enabling students to run automatic calculations and export charts and results for further investigation.

To find out more, [click here](#).

≡ FLOW THROUGH AN ORIFICE

HDMS H4

DETAILED SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

NETT DIMENSIONS AND WEIGHT:

670 mm high x 400 mm x 350 mm and 12.5 kg

APPROXIMATE PACKED DIMENSIONS AND WEIGHT:

0.18 m³ and 15 kg

SHARP-EDGED ORIFICE:

13 mm diameter

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:

9 mm square

ORIFICE MATERIAL:

Aluminium

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C