

## PIPEWORK ENERGY LOSSES

**HDMS** H34

Compact, bench-top apparatus compares pressure losses and  $k$  value of popular fittings in small-bore pipework.



SCREENSHOT OF THE HDMS SOFTWARE

### KEY FEATURES

- Compact, easy to fit and easy to use
- Direct comparison of pressure loss across different pipe fittings and their  $k$  value
- Includes three different bends - mitre, elbow and large radius
- Compares losses in a sudden enlargement (or expansion) and a contraction
- Includes a multi-tube piezometer for fundamental, accurate pressure measurements
- Works with TecEquipment's Digital Hydraulic Bench for easy installation and use
- Works with TecEquipment's optional, free Hydraulics Data Management System Software (HDMS)

### LEARNING OUTCOMES

Measurement and comparison of losses in:

- Mitre bend
- Elbow bend
- Large radius bend
- Sudden expansion
- Sudden contraction

### KEY SPECIFICATIONS

- Mitre and elbow bends
- Large radius bend
- Sudden expansion
- Sudden contraction
- Downstream control valve
- Ten pressure tapings

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## DESCRIPTION

This compact bench-top apparatus uses smooth, industry-standard plastic pipe, commonly used in domestic and other small-bore water systems.

It works with TecEquipment's Digital Hydraulic Bench (H1F, available separately)\*. The bench supports the apparatus and circulates and measures the water flowing through it.

This apparatus has a single circuit with bends, pressure tapping points and an expansion-contraction. A ball valve at the pipe exit controls water flow. The valve is downstream, so it does not cause any upstream turbulence.

Each pressure tapping point in the pipe connects to a piezometer tube in the vertical panel of the apparatus. During experiments, these tubes measure and compare pressure differences across the bends, expansion and contraction.

A useful diagram on the apparatus shows the main dimensions of the pipework and fittings. It also shows the positions of the tapping points and the tubes that they connect to. The product includes a hand-pump to adjust the datum of the piezometer tubes.

This apparatus is a smaller version of TecEquipment's Losses in Piping Systems (H16), which has two pipe circuits and scope for further project work.

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.

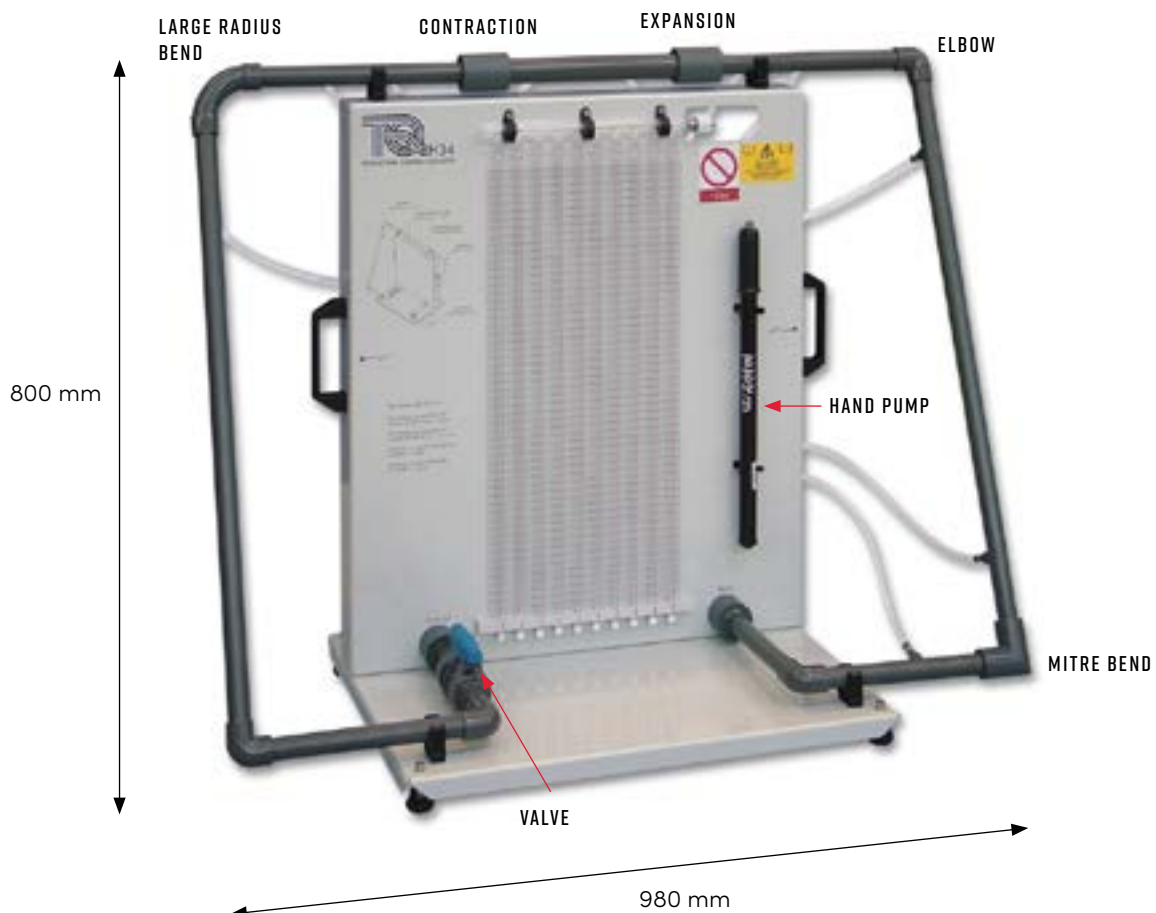
## STANDARD FEATURES

- Supplied with a comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives
- ISO9001 certified manufacturer

## ESSENTIAL BASE UNIT

- Digital Hydraulic Bench (H1F)\*

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



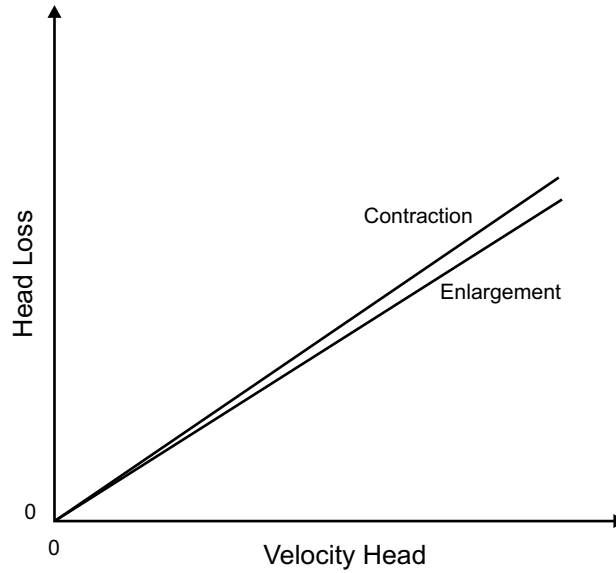
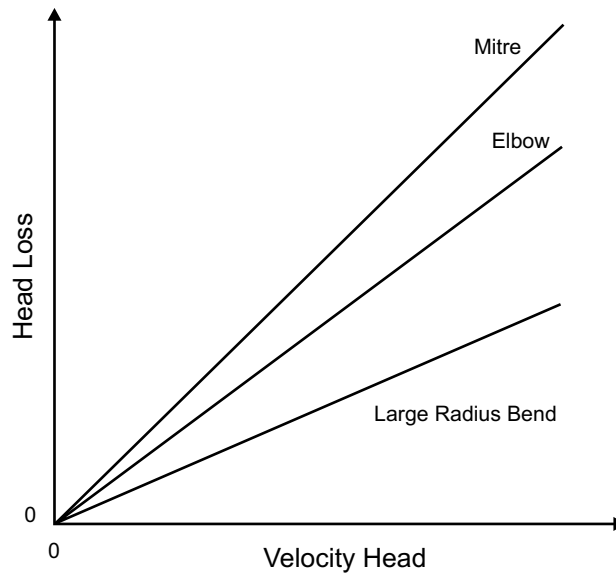
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HDM S H34

## TYPICAL WORK ASSIGNMENTS

### HEAD LOSS

This experiment measures the head loss across all parts of the pipework. When plotted against the velocity head, the results should be linear, with a gradient that gives the  $k$  values for the part.



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## HYDRAULICS DATA MANAGEMENT SYSTEM

The HDMS is a complimentary 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](#).

## 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:

980 mm wide x 800 mm high x 460 mm front to back and 12 kg

### APPROXIMATE PACKED DIMENSIONS AND WEIGHT:

0.5 m<sup>3</sup> and 20 kg

### BENDS AND FITTINGS:

- 90-degree mitre bend, elbow bend and large radius bend. All using 22 mm internal bore
- Sudden expansion from 22 mm to 28.4 mm
- Sudden contraction from 28.4 mm to 22 mm

### MAXIMUM WATER PRESSURE:

2 bar

## 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



SHOWN FITTED TO A HYDRAULIC BENCH (NOT INCLUDED)