H34 Pipework Energy Losses

Compares pressure losses and K value of popular fittings in small-bore pipework

Shown fitted to a hydraulic bench (H1D) (not included)

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 TecQuipment's Hydraulic Bench for easy installation and use

Learning Outcomes

- Measurement and comparison of losses in pipework bends
- Measurement and comparison of losses in a pipework expansion and contraction

Key Specifications

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

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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 TecQuipment'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 tappings 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 tappings 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 TecQuipment's Losses in Piping Systems (H16), which has two pipe circuits and scope for further project work.

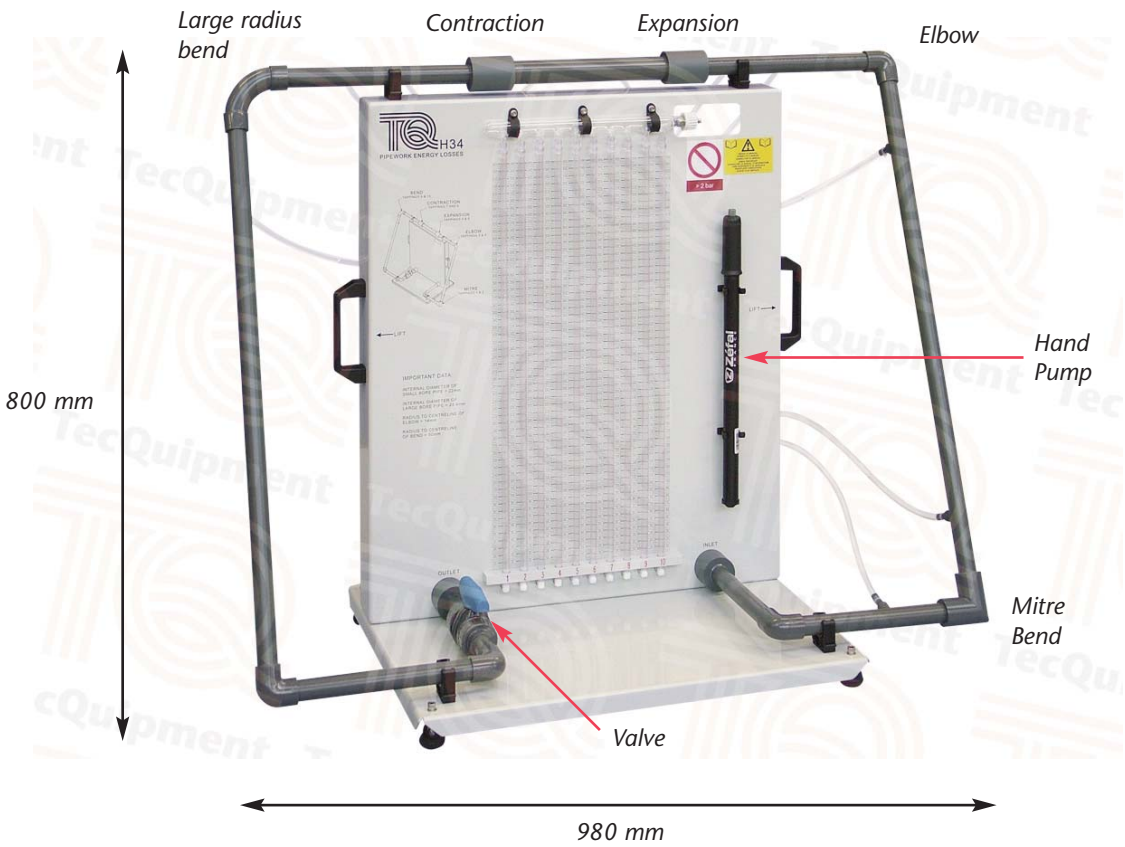
Standard Features

- 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 TecQuipment Gravimetric and Volumetric Hydraulic Benches (H1 and H1D)



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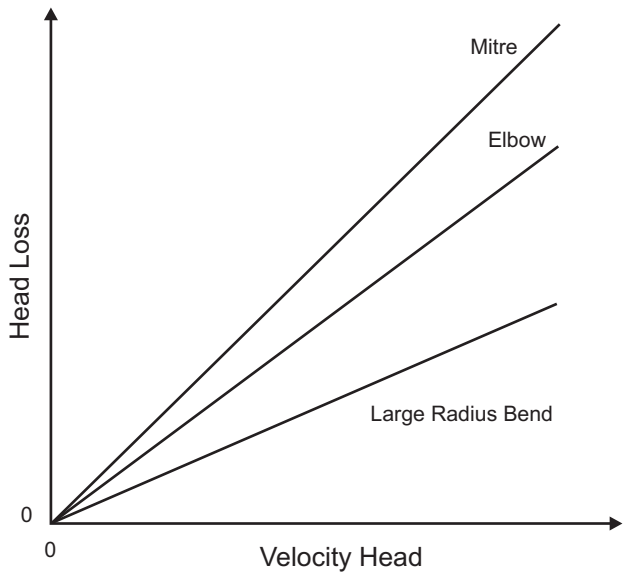
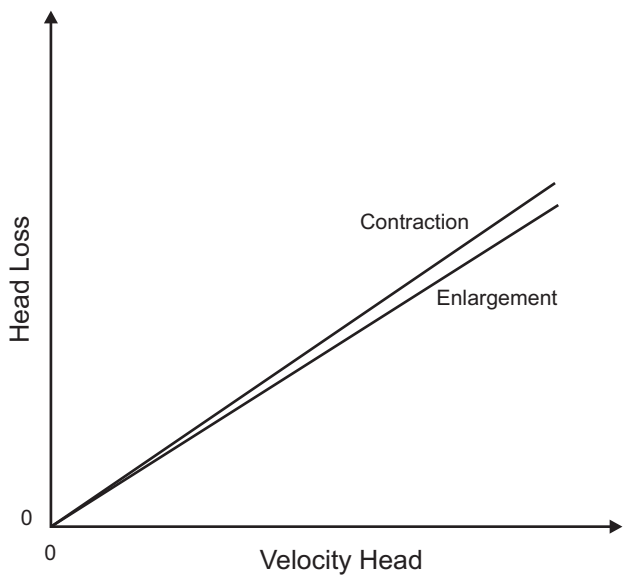
Typical Work Assignments

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.





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^3 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°