

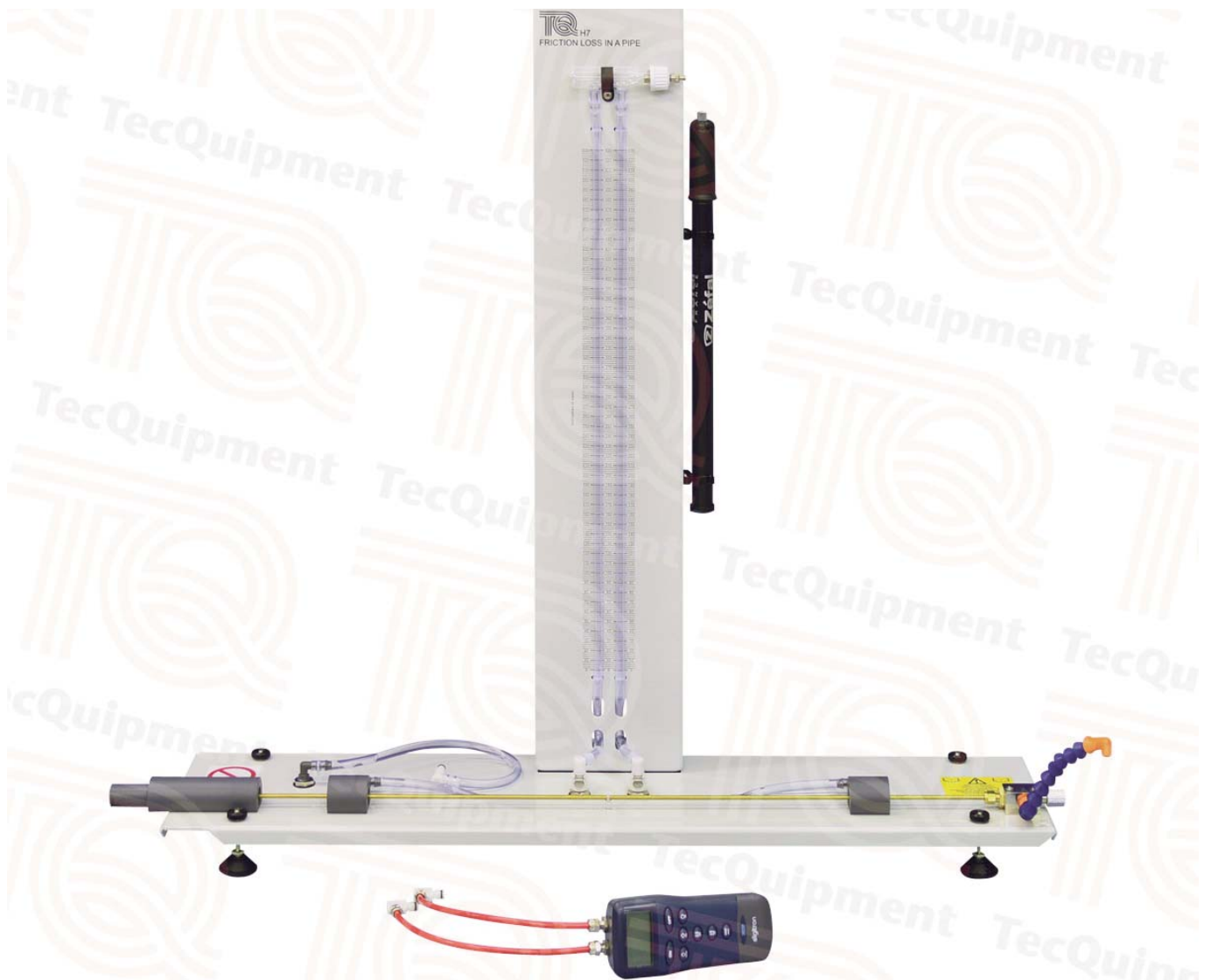


Fluid Mechanics

H7

Friction Loss in a Pipe

For direct measurement of friction loss in a small-bore horizontal pipe, during both laminar and turbulent flow



- Directly measures friction loss in a small-bore test pipe
- Investigates laminar and turbulent flow and the transition point
- Shows the critical Reynolds Number and verifies Poiseuille's Equation for laminar flow
- Includes precision valve for precise flow control and a Header Tank for good laminar flow
- Works with TecEquipment's Volumetric or Gravimetric Hydraulic Benches (H1 or H1D) for easy installation

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- An ISO 9001 certified company

H7

Friction Loss in a Pipe

Description

The Friction Loss in a Pipe apparatus allows students to study the change in the laws of resistance for laminar to turbulent flow and find the critical Reynolds number. The apparatus shows the flow transition point from laminar to turbulent, and is ideal for demonstrations as well as student experiments.

The equipment is a small-bore, straight test pipe on a base plate. It works with TecEquipment's Gravimetric or Volumetric Hydraulic Benches (H1 or H1D, available separately).

Static pressure tappings upstream and downstream of the test pipe connect to a water manometer or a hand-held digital pressure meter (supplied). The back panel holds the manometer with calibrated scales. The water manometer measures lower differential pressures in the laminar and lower turbulent flow regions (just above the critical Reynolds Number). The pressure meter measures higher pressures in the turbulent flow region. The water manometer includes an air valve and hand-pump. The hand-pump adjusts the datum of the water manometer where necessary. A precision needle valve downstream of the test pipe accurately controls flow rate.

To perform experiments, students stand the apparatus on the hydraulic bench and fit the Header Tank (supplied). For low flow rate experiments, the Header Tank supplies the test pipe. For higher flow rate experiments, the hydraulic bench supplies the test pipe directly. Students set the flow rate, measuring it by timing the collection of water in a measuring vessel (included).

Students take readings of temperature from a thermometer (supplied) and readings of head from the manometer or the pressure meter. They then use the results to produce charts to help compare actual results with theory.

Standard Features

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



Shown fitted to the Volumetric Hydraulic Bench (H1D)

Experiments

Study of friction loss in a pipe, including:

- Investigations of laminar and turbulent flows
- Demonstration and measurement in the change of the laws of resistance (friction factor) from laminar to turbulent flow
- Finding the critical Reynolds Number
- Verifying Poiseuille's Equation and the coefficient of viscosity for water in the laminar flow region

Essential Base Unit

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

Essential Services

Water supply:

From the hydraulic bench (H1 or H1D)

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

Specification

Main unit nett dimensions (assembled):

1000 mm long x 840 mm high x 240 mm front to back and 6 kg.

Header tank nett dimensions (assembled):

400 mm high x 250 mm outside diameter and 800 mm overflow/support pipe. Combined 5 kg.

Total nett weight:

12 kg

Approximate packed dimensions and weight:

0.2 m³ and 15 kg

Test pipe internal diameter (nominal):

3 mm

Water manometer range:

0 to 530 mm water

Pressure meter range:

0 to 20 m water

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