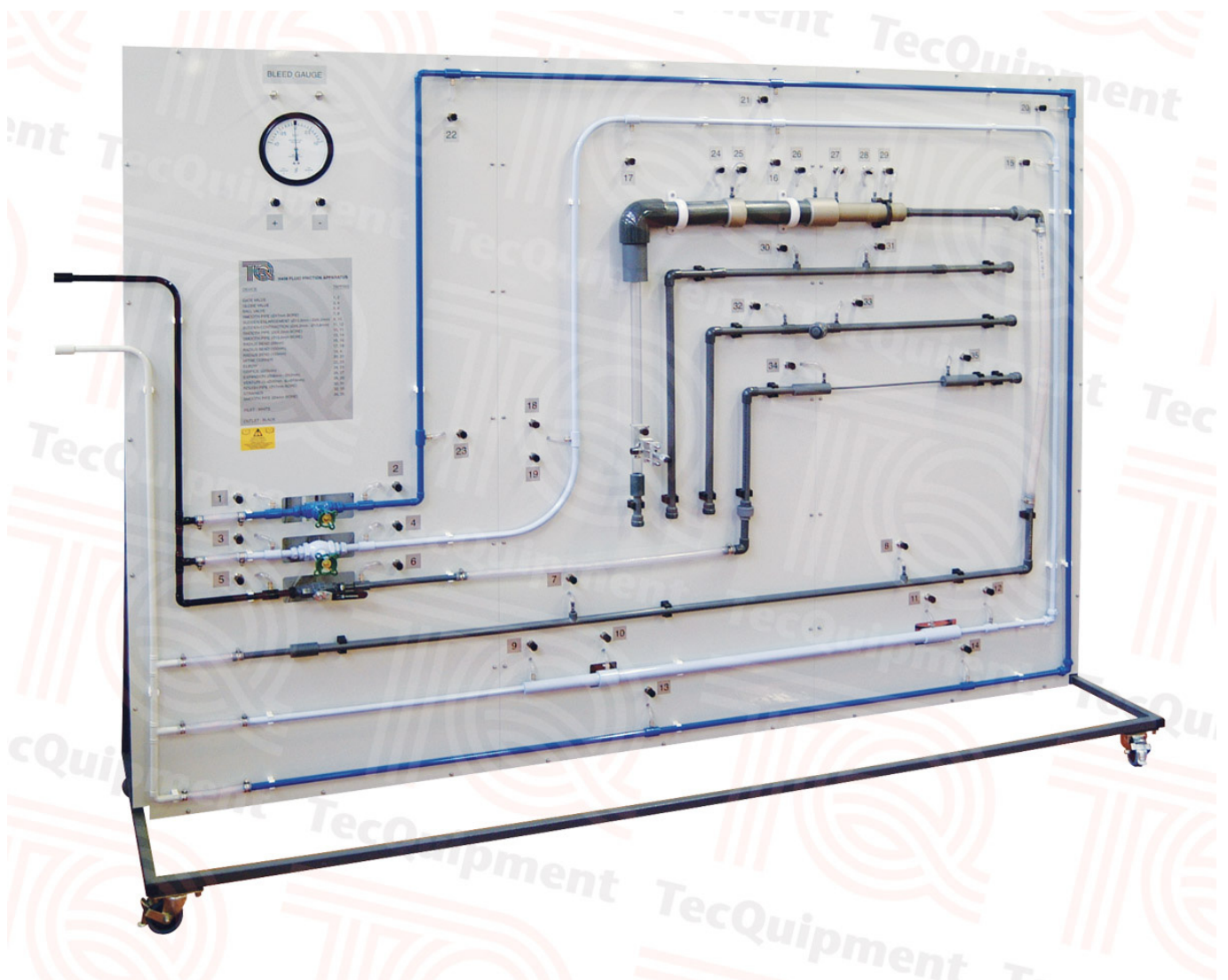


H408

Fluid Friction Apparatus

Shows flow and losses in different pipes, fittings and valves. Shows popular flow measurement instruments.



- A space-saving vertical panel that works with TecEquipment’s Gravimetric or Volumetric Hydraulic Benches for easy installation
- Includes different valves, pipes and fittings to show losses
- Includes experiments on roughened pipes
- Shows laminar and turbulent flow
- Uses Bernoulli’s equation
- Shows how to use Venturi and orifice meters to measure flow
- Includes a traversing Pitot tube to measure velocity profile

- TecEquipment Ltd, Bonsall Street, Long Eaton, Nottingham NG10 2AN, UK
- **T** +44 115 972 2611 • **F** +44 115 973 1520 • **E** info@tecquipment.com • **W** www.tecquipment.com
- An ISO 9001 certified company



H408

Fluid Friction Apparatus

Description

TecEquipment's Fluid Friction Apparatus allows students to study flow, flow measurement techniques and losses in a wide variety of pipes and fittings.

The equipment has three water circuits with instruments, pipes and pipe system components. These allow students to examine and compare the different component characteristics. A hydraulic bench (Gravimetric (H1) or Volumetric (H1D), available separately) supplies the circuit with a controlled flow of water. A space-saving vertical panel holds all the parts for easy use.

To measure pressure loss across components, students use a piezometer set and differential pressure gauge (included).

To perform experiments students record the temperature of water in the hydraulic bench and set the hydraulic bench to pump water through a circuit. They measure pressure losses across instruments or components. The hydraulic bench gives an external flow rate for reference and comparison.

The flow measurement instruments show students the common methods of measuring water flow. They also give applications of the steady flow energy equation (Bernoulli's equation). Students use a Venturi meter and an orifice plate meter and compare the losses of each. They also find the losses in a rapid enlargement.

The equipment also includes a Pitot-static tube. By traversing the Pitot across the pipe diameter, students can find the velocity profile and flow coefficients. They also find the relationship between the flow rate and pressure differential.

An artificially roughened pipe allows students to study friction factor at different Reynolds numbers, covering the interesting transitional flow from laminar to turbulent. They can compare results to those predicted by Nickuradse's results and a Moody chart.

Standard Features

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

Essential Ancillaries

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

Experiments and Investigations

- Laminar, transitional and turbulent flows
- Use of the Pitot-static tube
- Flow measurement using a Venturi meter and an orifice meter
- Smooth pipes
- Artificially roughened pipe
- Straight pipe loss
- Sudden expansion and contraction
- Bends and elbows
- Valves
- In-line strainer

Essential Services

Water supply:

From the hydraulic bench (H1 or H1D)

Floor space needed:

3 m x 1.5 m (plus space for the hydraulic bench)

Operating Conditions

Operating environment:

Laboratory environment

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

Nett dimension and weight:

2.5 m long x 1.9 m high x 1 m front to back and 210 kg

Packed dimensions and weight:

5.7 m³ and 348 kg

Main parts:

- Smooth pipes of various sizes
- Artificially roughened pipe
- 90-degree mitre and elbow
- 90-degree smooth bends (up to 150 mm radius)
- Sudden enlargement
- Sudden contraction
- Gate valve, globe valve and ball valve
- Venturi meter and orifice meter
- Pitot static tube
- In-line strainer
- Test Pipes with inside diameters from 4 mm to 17 mm

- TecEquipment Ltd, Bonsall Street, Long Eaton, Nottingham NG10 2AN, UK
- **T** +44 115 972 2611 • **F** +44 115 973 1520 • **E** info@tecquipment.com • **W** www.tecquipment.com
- An ISO 9001 certified company