

Fluid Science - FS series

Energy Losses - Bends FS-1.3

USED TO DEMONSTRATE ENERGY LOSSES DUE TO THE GEOMETRY OF THE FLOW PATH

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Energy Losses in Bends Tray FS-1.3

learning via hands-on experimentation.

meaningful comparisons to be made.

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The Fluid Science range is an innovative suite of products designed

to be used to demonstrate energy losses due to the geometry of the flow path enabling High School students to gain an understanding of the fundamentals of Fluid Mechanics and Thermo Fluids by the process of

The Fluid Science Energy Losses in Bends Tray includes experiments to measures the pressure drop across, a smooth bend, a tight bend, a Mitre bend. All the pipe test section are of the same cross section, enabling

The additional energy losses due to the geometry of the flow path can be clearly seen at different flow rates and the relationship to theory

SERIES

can be established.

Base Unit supplied separately



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Applications ME ChE CE IP

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Description

The Fluid Science FS-1.3 Energy Losses in Bends Tray provides hands on experimentation designed to demonstrate energy losses due to the geometry of the flow path at different flow rates.

Utilising the FS-SU service unit the experiments rapidly mount onto the multifunctional work panel and is connected to the built-in water supply via quick connect couplings.

The differential pressure reading is taken using a digital manometer against varying flow rates.

The tray includes the following Hydraulic Circuits:

Energy losses in bends

- Shallow bend radii 42mm, 6mm diameter
- Tight bend radii 9mm, 6mm diameter
- Mitre bend, 6mm diameter

Requirements

Scale

Electrical supply:

FS 🗲 TRAY 1Ph

100-240V/1 Phase, 50-60Hz

Initial fill of 5ltrs water. Drain to empty water away once experiment is complete. During use, water supply or drainage are not required.

Essential Accessories / Equipment

FS-SU Fluid Science Service Unit



Overall dimensions

Dimensions Stowed – Trays measure	
Length	0.43m
Width	0.312m
Height	0.080m
Dimensions Set Up for Energy Loss in Bends Experiment	
Length	0.21m
Width	0.092m
Height	0.064m
Packed and created shipping specifications	
Net weight	1.41Kg
Gross weight (Tray only)	4.02Kg

Demonstration / instructional capabilities

- Explanation of basic principles such as conservation of mass
- Conservation of energy
- Explain energy loss and frictional loss
- Types of flow steady and unsteady flow, uniform and non-uniform flow etc
- Types of fluid flow regime i.e. laminar, turbulent and transitional flow
- Compare measured pressure drop from 3 different pipe forms, explaining the effect of geometry on pressure drop.
- Using Bernoulli's equation, calculate the pressures and compare results with experimental values.
- Calculate the frictional head loss and pressure drop using Darcy's equation

Features

- Shallow bend radii 42mm, 6mm diameter
- Tight bend radii 9mm, 6mm diameter
- Mitre bend, 6mm diameter
- Differential pressure reading obtained using digital manometer
- Highly visual design

Benefits

- Applied student learning via experimentation
- Common service unit can be used for either hot or cold-water supply
- Tool-less assembly
- Designed to be highly visual and simple to use
- Quick setup
- Suitable for both classroom and laboratory environment

Related products

Fluid Science Range

- FS-SU Service Unit
- ► FS-1.1 Flow Measurement
- ► FS-1.2 Energy Losses Straight Pipes
- FS-2.1 Manometer Inclined
- ► FS-2.2 Manometer U tube
- ▶ FS-3.1 Heat Exchanger Shell and Tube
- FS-3.2 Heat Exchanger Tubular
- ► FS-3.3 Heat Exchanger Cross Flow
- ► FS-3.4 Heat Exchanger Plate
- ► FS-4.1 Fluidised Bed

Ordering codes

FS-SU FS-1.3



Aftercare

Installation Commissioning Training Service and maintenance Support: armfieldassist.com

Knowledge base

> 28 years expertise in research & development technology
> 50 years providing engaging engineering teaching equipment
Benefit from our experience, just call or email to discuss your
laboratory needs, latest project or application.