



The Armfield Flow Meter Demonstration Unit is a self-contained facility designed to demonstrate the important characteristics of 14 types of flow meter used in the measurement of water flow through pipes or open channels. Equipment purchase can be configured to suit the course being followed (see Meter Selection Chart).

DEMONSTRATION CAPABILITIES

- > Comparing the use, application and limitations of various types of flow meter
- > Considering the implications of flow meter selection on performance, accuracy, convenience, cost and head loss
- > Understanding the principles on which different types of flow meter are based
- > Relating pressure drop across a flow meter to flow rate
- > Using manometers to measure pressure drop
- > Investigating the effect of air in the hydraulic stream on flow meter performance
- > Understanding the application of Bernoulli's Theorem



DESCRIPTION

The Armfield Flow Meter Demonstration Unit is a self-contained facility to demonstrate the important characteristics of flow meters. The main elements are a service module and flow meter support stand.

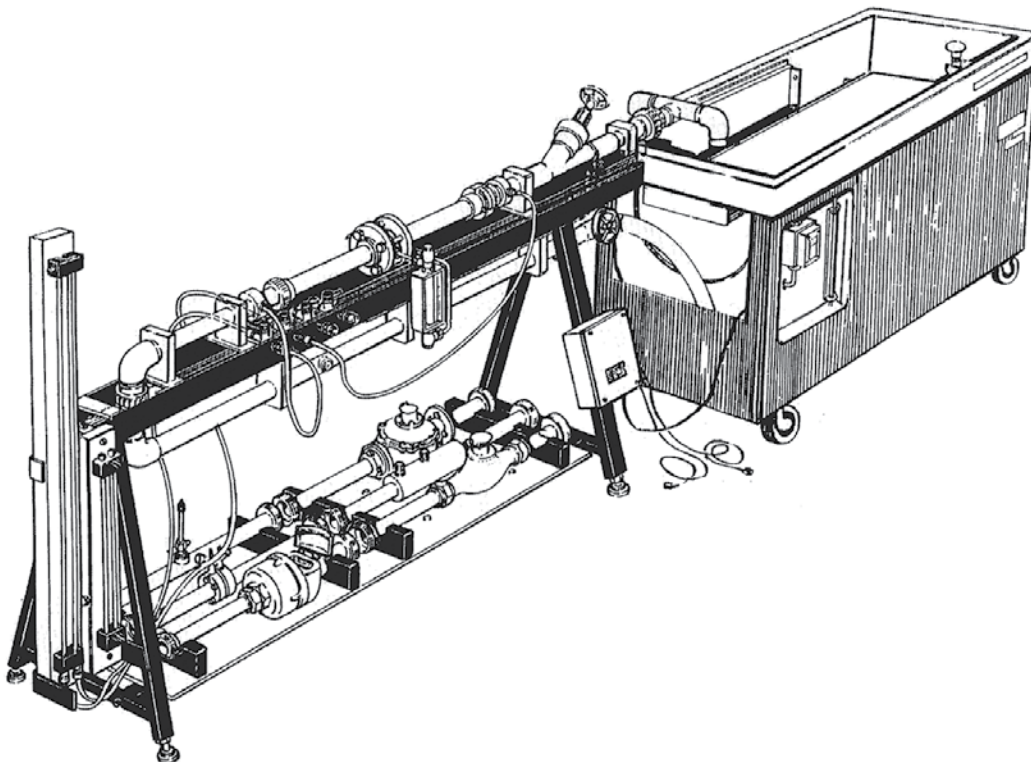
A self priming centrifugal pump draws water from the sump tank in the service module and delivers it to a flow meter test pipe. Industrial type flow meters mounted in test sections can be fitted into the test pipe quickly and easily. These meters have been chosen to give a variety of different metering principles and degrees of sophistication and accuracy. Some of the meters are calibrated directly in units of flow, whilst others involve the use of calibration charts.

The pressure drop across each of the flow meters can be measured by using either the one metre pressurised water manometer or the 0.5 metre mercury manometer supplied. Ported manometer connection valves ensure rapid bleeding of all manometer pipework. A facility exists to admit air into the hydraulic stream to demonstrate the effect on the meter's accuracy. The discharge from the test section is controllable and is fed through a diffuser into the channel of the service module. A V-Notch and Rectangular Notch Weir can be fitted into the service module.

An auxiliary channel (C9-15) accommodates the Broad Crested and Crump Weirs also the 'H' Flume and Washington Flume. Levels in the channel can be determined by using the Hook and Point Gauge (H1).

Water discharging from the flow meter on test is collected in a volumetric tank where the flow may be determined absolutely. This tank is stepped to accommodate high or low flow rates and incorporates a stilling baffle to reduce turbulence. A remote sight tube and scale connected to a tapping in the base of the volumetric tank enable an instantaneous indication of water level. Water is returned to the sump tank by a dump valve. The basic system incorporates a reference flow meter, which has been chosen for reliability and accuracy. This meter remains installed whereas other meters are selected from their storage position on the apparatus and tested as desired.

In addition to being a valuable teaching aid, the apparatus brings to the laboratory a selection of instruments that can be used to support student project work. A full set of instructions is provided, including details for testing and comparison of flow meters.

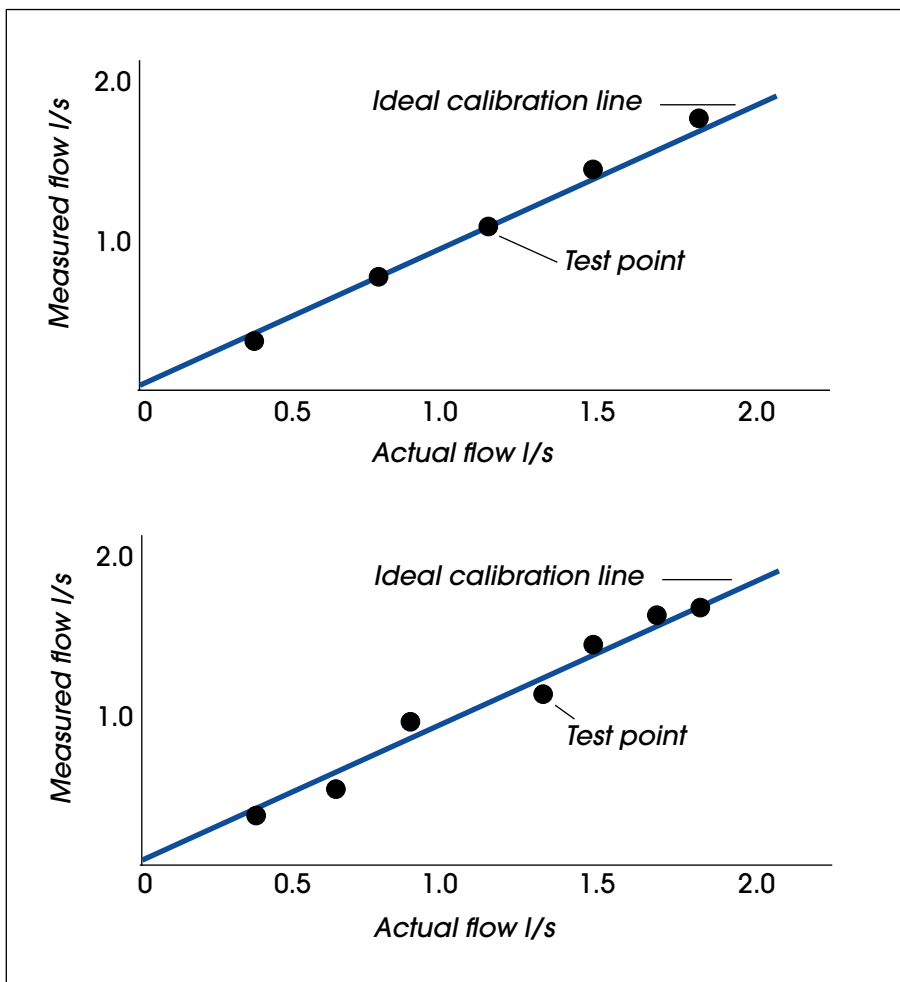


METER SELECTION CHART

TECHNICAL DETAILS

Ordering Code	Ordering Code	C9/20	C9/21	C9/22	C9/23	C9/00
	Course bias					
	Meter type	Basic rig	Mechanical/ Chemical	Civil	Agricultural	Comprehensive
C9/1	Venturi	.	.			.
C9/2	Orifice	.	.			.
C9/3	Pitot	.	.			.
C9/4	Shunt gapmeter	.	.			.
C9/5	Swinging flap		.			.
C9/6	Volumetric rotary piston		.			.
C9/7	Electromagnetic		.	.		.
C9/8	Helical rotary			.	.	.
C9/9	Inferential multi-stream			.	.	.
C9/10	Current meter			.	.	.
C9/11	Broad Crested Weir			.		.
C9/12	Crump Weir			.	.	.
C9/13	'H' Flume				.	.
C9/14	Washington Flume				.	.
C9/15	Channel for C9/10-14			.	.	.
C9/16	D.P. meter for C9/1-3		.			.

Maximum flow rate:	2.3 litres/s
Reservoir capacity:	140 litres
Volumetric tank capacity:	40 litres
Nominal bore of pipework:	38mm
Length of removable test pipe:	750mm
Pump motor rating:	0.55kW



Calibration of a venturi meter (top) and a shunt gapmeter (bottom)

REQUIREMENTS

Electrical supply:

C9-(00/20/21/22/23)-A: 220-240V/1ph/50Hz, 10A

C9-(00/20/21/22/23)-B: 120V/1ph/60Hz, 20A

C9-(00/20/21/22/23)-G: 220-240V/1ph/60Hz, 10A

Water supply: Initial fill with clean water

RECOMMENDED INSTRUMENTS

Stopwatch

OVERALL DIMENSIONS

Height: 1.50m

Width: 3.50m

Depth: 1.00m

SHIPPING SPECIFICATION

Volume: 3m³

Gross weight: 400kg

COMPLEMENTARY PRODUCTS

C1MkII: Compressible Flow Unit

C15: Computer Controlled Wind Tunnel

C3MkII: Multi-pump Test Rig

C4MkII: Multi-purpose Teaching Flume

C6MkII: Fluid Friction Measurements

C7: Pressure Surge in a Pipe & Water Hammer Apparatus

C10: Laminar Flow Analysis Table

C11: Flow in Pipe Networks

F1-10: Hydraulics Bench & Accessories with
F1-ABASIC Computer Aided Learning
Software (Windows)

OPTIONAL ACCESSORIES

For installations where the use of mercury is undesirable or prohibited a digital pressure meter is available (H12-8), ask for data sheet:

H Series: Hydraulic Measurement Instruments.

ORDERING SPECIFICATION

- A self-contained apparatus to demonstrate the characteristics of flow meters used in measurement of water flow through pipes or open channels
- Service module with reservoir, volumetric measuring tank and pump
- Reference turbine flow meter permanently fitted
- Metering devices available in various combinations to suit coursework

Selection from fourteen devices:

- > Venturi
 - > Orifice
 - > Pitot
 - > Shunt gapmeter
 - > Swinging flap
 - > Volumetric rotary piston
 - > Electromagnetic
 - > Helical rotary
 - > Inferential multi-stream
 - > Current meter
 - > Broad Crested Weir
 - > Crump Weir
 - > 'H' Flume
 - > Washington Flume
- Quick and easy removal of test meters for evaluation and inspection
 - Air entrainment facility
 - Meters can be used independently to support research or student project work
 - User instruction manual provides installation, commissioning and maintenance data, together with project exercises

TOXIC MATERIALS:

Due to international restrictions limiting the transport of toxic materials, we do not include mercury in our supply.



* Excluding DM range



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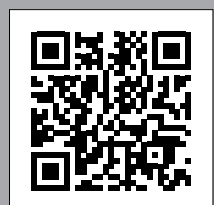
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