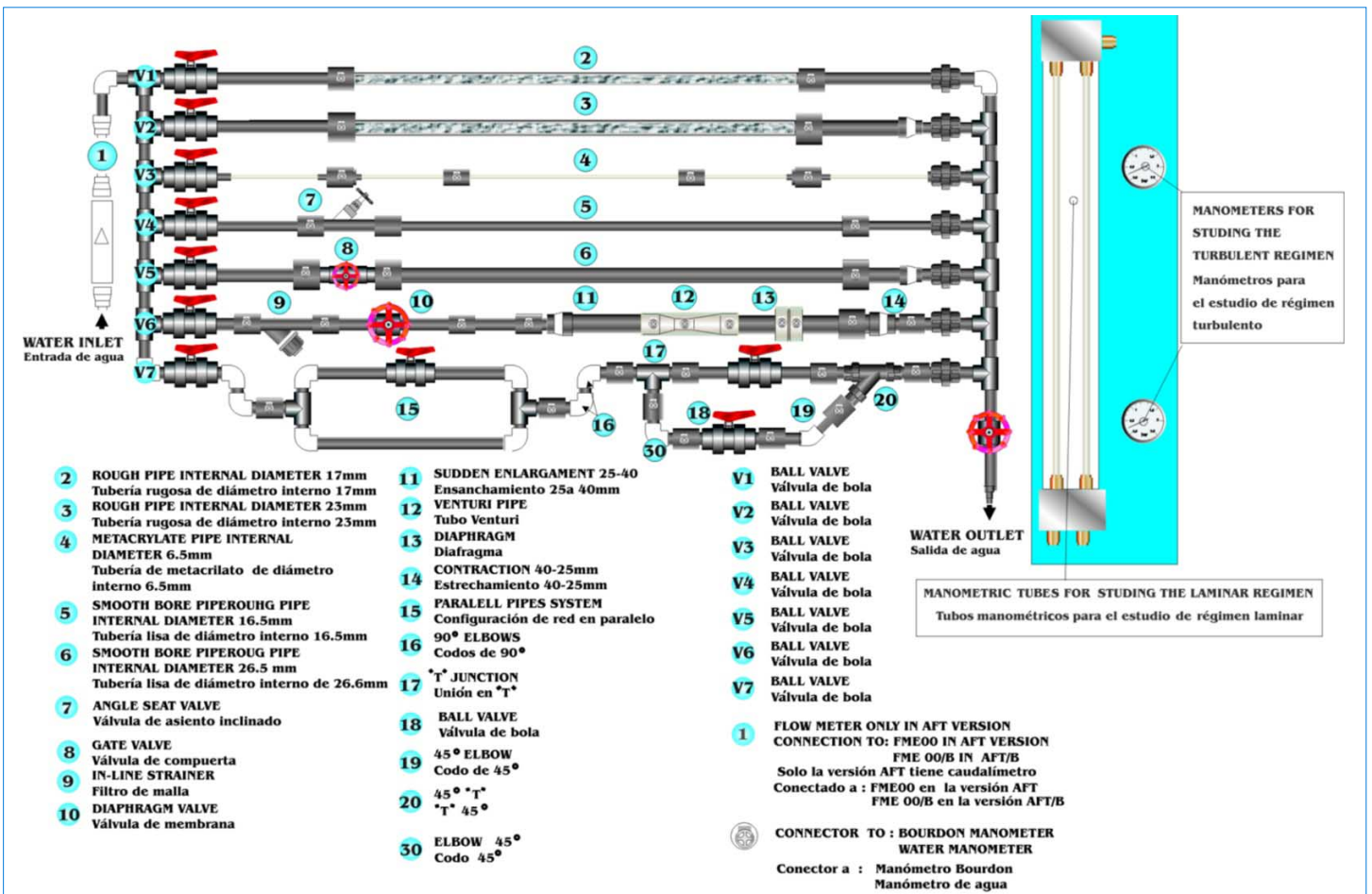




www.edibon.com

Products
Products range
Units
8.-Fluid Mechanics
and Aerodynamics

PROCESS DIAGRAM AND ELEMENTS ALLOCATION



DESCRIPTION

This unit allows the detailed study of fluid friction head losses which occur when a fluid flows through pipes, fittings and flow metering elements.

SPECIFICATIONS

Anodized aluminium structure and panel in painted steel.

Main metallic elements in stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Quick connections.

Rapidity and facility to replace parts of the unit, in case of failure or breaking.

Transparent elements.

Flowmeter, range: 600-6000 l/h. (10-100 l/min.).

Pipes:

Rough pipe of diameter $D = 17$ mm. (PVC).

Rough pipe of diameter $D = 23$ mm. (PVC).

Smooth pipe of diameter $D = 6.5$ mm. (methacrylate).

Smooth pipe of diameter $D = 16.5$ mm. (PVC).

Smooth pipe of diameter $D = 26.5$ mm. (PVC).

Manometers:

2 Manometric tubes. Range: 1000 mm. H_2O .

2 Bourdon type manometers. Range: 0-2.5 bar.

34 Pressure takings.

Inclined seat valve.

Floodgate valve.

Flow regulation valves.

Ball valves.

Membrane valve.

Inline strainer.

Abrupt broadening.

Abrupt contraction.

Venturi tube of transparent plastic.

Diaphragm of transparent plastic.

Symmetrical bifurcation.

Two 90° elbows (in S).

45° elbow.

90° elbow.

T-junction.

Inclined T-junction.

Pipes in parallel configurations.

Pipe section with a Pitot tube and static tapping.

Hydraulics Bench (FME00):

Mobile hydraulic bench, made in polyester reinforced with fibreglass, and mounted on wheels for mobility.

Centrifugal pump, 0.37 KW, 30 - 80 l/min at 20.1-12.8 m., single phase 220V. / 50Hz or 110V. / 60Hz.

Runner made in stainless steel.

Sump tank capacity: 165 litres.

Small channel: 8 litres.

Flow measurement: volumetric tank, gauged from 0 to 7 litres for low flow values and from 0 to 40 litres for high flow values.

Control valve for regulating the flow.

Remote hand-operating dump valve in the base of the volumetric tank.

Cables and accessories, for normal operation.

Manuals:

This unit is **supplied with the following manuals**: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

Some Practical Possibilities of the Unit:

- 1.- Load loss by friction in a rough pipe of 17 mm of interior diameter.
 - 2.- Load loss by friction in a rough pipe of 23 mm of interior diameter.
 - 3.- Load loss by friction in a smooth pipe of 6.5 mm of interior diameter.
 - 4.- Load loss by friction in a smooth pipe of 16.5 mm of interior diameter.
 - 5.- Load loss by friction in a smooth pipe of 26.5 mm of interior diameter.
 - 6.- Influence of the diameter in the load loss by friction in rough pipes.
 - 7.- Influence of the diameter in the load loss by friction in smooth pipes.
 - 8.- Load loss by friction in smooth and rough pipes.
 - 9.- Friction coefficient in a rough pipe of 17 mm of interior diameter.
 - 10.- Friction coefficient in a rough pipe of 23 mm of interior diameter.
 - 11.- Friction coefficient in a smooth pipe of 6.5 mm of interior diameter.
 - 12.- Friction coefficient in a smooth pipe of 16.5 mm of interior diameter.
 - 13.- Friction coefficient in a smooth pipe of 26.5 mm of interior diameter.
 - 14.- Influence of the diameter in the friction coefficient in rough pipes.
 - 15.- Influence of the diameter in the friction coefficient in smooth pipes.
 - 16.- Friction coefficient in smooth and rough pipes.
 - 17.- Load losses in the inclined seat valve.
 - 18.- Load losses in the floodgate valve.
 - 19.- Load losses in the filter.
 - 20.- Load losses in the membrane valve.
 - 21.- Load losses in an abrupt broadening.
 - 22.- Load losses in the Venturi.
 - 23.- Load losses in the diaphragm.
 - 24.- Load losses in an abrupt contraction.
 - 25.- Load losses in the accessories.
 - 26.- Flow measurements by load loss in a Venturi.
 - 27.- Flow measurements by load loss in a diaphragm.
 - 28.- Flow measurements by means of load loss.
 - 29.- Load losses in a symmetrical bifurcation.
 - 30.- Load losses after two 90° elbows.
 - 31.- Load losses in a T-junction.
 - 32.- Load losses for a 90° elbows.
 - 33.- Load losses on the ball valve.
 - 34.- Load losses for an elbow of 45°.
 - 35.- Load losses in a inclined T-junction.
 - 36.- Study of laminar regime.
 - 37.- Study of turbulent regime.
- Other possible practices:
- 38.- Filling of the manometers.
 - 39.- Universal graph for the pipe calculation.

REQUIRED SERVICES

- Electrical supply: Single phase, 220V./50Hz or 110V./60Hz.
- Water supply and drainage.

DIMENSIONS & WEIGHTS

- AFT dimensions: 2300 x 850 x 2100 mm. approx.
- AFT weight: 200 Kg. approx.

OPTIONAL (for AFT, AFT/B and AFT/P)

AFT/CAL. Computer Aided Learning Software (Results Calculation and Analysis).

This Computer Aided Learning Software (CAL) is a Windows based software, simple and very easy to use specifically developed by EDIBON.

CAL is a class assistant that helps making the necessary calculations to extract the right conclusions from data obtained during the experimental practices. With a single click, CAL computes the value of all the variables involved. Also, CAL gives the option of plotting and printing the results.

Simply insert the experimental data, with a single click CAL will perform the calculations.

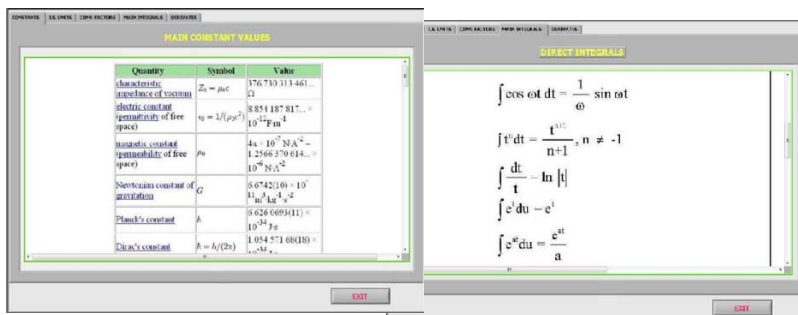


Once the Area of study is selected, the right module can be chosen among a wide range, each one with its own set of lab exercises.

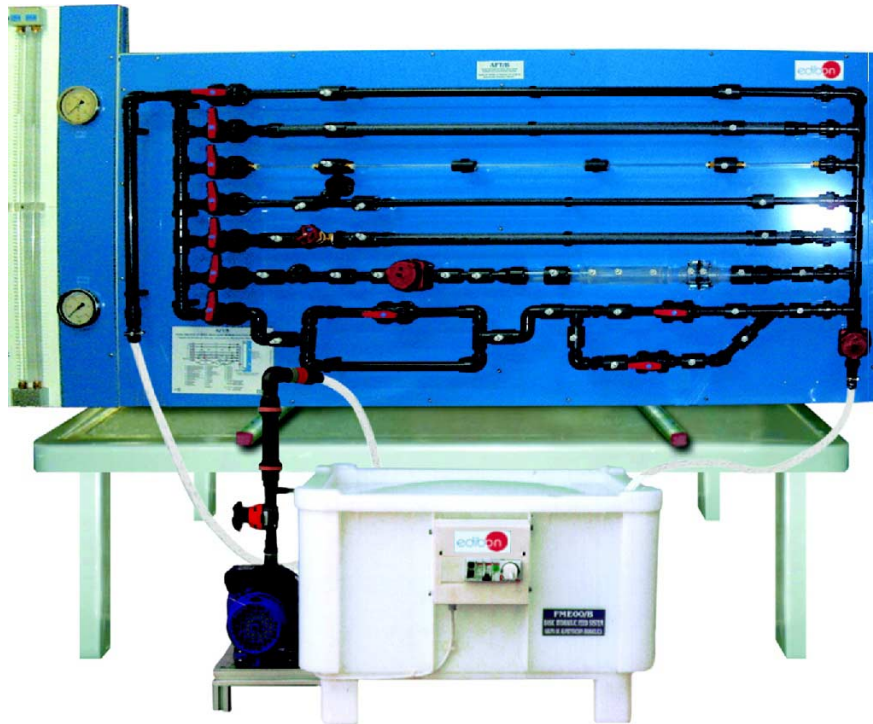


Between the plotting options, any variable can be represented against any other. And there exist a great range of different plotting displays.

Among the given choices, an additional help button can be found, which offers a wide range of information, such as constant values, unit conversion factors and integral and derivative tables:



It includes a handy option to avoid using different reference sources while in progress. For example: the value of Physical constants, their symbols and right names, conversion factors and the very useful Integral and Derivative tables.



DESCRIPTION

This unit allows the detailed study of fluid friction head losses which occur when a fluid flows through pipes, fittings and flow metering elements.

SPECIFICATIONS

Anodized aluminium structure and panel in painted steel. Main metallic elements in stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Quick connections. Rapidity and facility to replace parts of the unit, in case of failure or breaking. Transparent elements.

Pipes:

Rough pipe of diameter $D = 17$ mm. (PVC). Rough pipe of diameter $D = 23$ mm. (PVC).

Smooth pipe of diameter $D = 6.5$ mm. (Methacrylate).

Smooth pipe of diameter $D = 16.5$ mm. (PVC). Smooth pipe of diameter $D = 26.5$ mm. (PVC).

Manometers:

2 Manometric tubes. Range: 1000 mm. H_2O .

2 Bourdon type manometers. Range: 0-2.5 bar.

34 Pressure takings.

Inclined seat valve. Floodgate valve. Flow regulation valves. Membrane valve.

Ball valves.

Inline strainer.

Abrupt broadening. Abrupt contraction.

Venturi tube of transparent plastic.

Diaphragm of transparent plastic.

Symmetrical bifurcation.

T-junction.

Inclined T-junction.

45° elbow. 90° elbow. Two 90° elbows (in S).

Pipes in parallel configurations.

Pipe section with a Pitot tube and static tapping.

Basic Hydraulic Feed System (FME00/B):

Centrifugal pump: 0.37 KW, 30 - 80 l/min at 20.1-12.8m. single-phase 220V. / 50Hz. or 110V. / 60Hz. Stainless steel impeller.

Pump breaker starting. Safety differential switch.

Tank capacity: 140 litres approx.

Flowmeter.

Membrane type flow adjusting valve.

Cables and accessories, for normal operation.

Manuals:

This unit is **supplied with the following manuals**: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

Some Practical Possibilities of the Unit:

- 1.- Load loss by friction in a rough pipe of 17 mm of interior diameter.
 - 2.- Load loss by friction in a rough pipe of 23 mm of interior diameter.
 - 3.- Load loss by friction in a smooth pipe of 6.5 mm of interior diameter.
 - 4.- Load loss by friction in a smooth pipe of 16.5 mm of interior diameter.
 - 5.- Load loss by friction in a smooth pipe of 26.5 mm of interior diameter.
 - 6.- Influence of the diameter in the load loss by friction in rough pipes.
 - 7.- Influence of the diameter in the load loss by friction in smooth pipes.
 - 8.- Load loss by friction in smooth and rough pipes.
 - 9.- Friction coefficient in a rough pipe of 17 mm of interior diameter.
 - 10.- Friction coefficient in a rough pipe of 23 mm of interior diameter.
 - 11.- Friction coefficient in a smooth pipe of 6.5 mm of interior diameter.
 - 12.- Friction coefficient in a smooth pipe of 16.5 mm of interior diameter.
 - 13.- Friction coefficient in a smooth pipe of 26.5 mm of interior diameter.
 - 14.- Influence of the diameter in the friction coefficient in rough pipes.
 - 15.- Influence of the diameter in the friction coefficient in smooth pipes.
 - 16.- Friction coefficient in smooth and rough pipes.
 - 17.- Load losses in the inclined seat valve.
 - 18.- Load losses in the floodgate valve.
 - 19.- Load losses in the filter.
 - 20.- Load losses in the membrane valve.
 - 21.- Load losses in an abrupt broadening.
 - 22.- Load losses in the Venturi.
 - 23.- Load losses in the diaphragm.
 - 24.- Load losses in an abrupt contraction.
 - 25.- Load losses in the accessories.
 - 26.- Flow measurements by load loss in a Venturi.
 - 27.- Flow measurements by load loss in a diaphragm.
 - 28.- Flow measurements by means of load loss.
 - 29.- Load losses in a symmetrical bifurcation.
 - 30.- Load losses after two 90° elbows.
 - 31.- Load losses in a T-junction.
 - 32.- Load losses for a 90° elbows.
 - 33.- Load losses on the ball valve.
 - 34.- Load losses for an elbow of 45°.
 - 35.- Load losses in a inclined T-junction.
 - 36.- Study of laminar regime.
 - 37.- Study of turbulent regime.
- Other possible practices:
- 38.- Filling of the manometers.
 - 39.- Universal graph for the pipe calculation.

REQUIRED SERVICES

- Electrical supply: Single phase, 220V./50Hz or 110V./60Hz.
- Water supply and drainage.

DIMENSIONS & WEIGHTS

- AFT/B dimensions: 2300 x 850 x 2000 mm. approx.
- AFT/B weight: 170 Kg. approx.

OPTIONAL

AFT/CAL. **Computer Aided Learning Software (Results Calculation and Analysis).**

*Specifications subject to change without previous notice, due to the convenience of improvements of the product.



DESCRIPTION

This unit allows the detailed study of fluid friction head losses which occur when a fluid flows through pipes, fittings and flow metering elements.

SPECIFICATIONS

Anodized aluminium structure and panel in painted steel. Main metallic elements in stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Quick connections.

Rapidity and facility to replace parts of the unit, in case of failure or breaking.

Transparent elements.

Flowmeter, range: 600-6000 l/h. (10-100 l/min.).

Pipes:

Rough pipe of diameter $D = 17$ mm. (PVC).

Rough pipe of diameter $D = 23$ mm. (PVC).

Smooth pipe of diameter $D = 6.5$ mm. (methacrylate).

Smooth pipe of diameter $D = 16.5$ mm. (PVC).

Smooth pipe of diameter $D = 26.5$ mm. (PVC).

Manometers:

2 Manometric tubes. Range: 1000 mm. H_2O .

2 Bourdon type manometers. Range: 0-2.5 bar.

34 Pressure takings.

Inclined seat valve.

Floodgate valve.

Flow regulation valves.

Membrane valve.

Inline strainer.

Ball valves.

Abrupt broadening.

Abrupt contraction.

Venturi tube of transparent plastic.

Diaphragm of transparent plastic.

Symmetrical bifurcation.

Two 90° elbows (in S).

T-junction.

Inclined T-junction.

45° elbow and 90° elbow.

Pipes in parallel configurations.

Pipe section with a Pitot tube and static tapping.

Cables and accessories, for normal operation.

Manuals:

This unit is **supplied with the following manuals**: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

Some Practical Possibilities of the Unit:

- | | |
|---|--|
| <ol style="list-style-type: none"> 1.- Load loss by friction in a rough pipe of 17 mm of interior diameter. 2.- Load loss by friction in a rough pipe of 23 mm of interior diameter. 3.- Load loss by friction in a smooth pipe of 6.5 mm of interior diameter. 4.- Load loss by friction in a smooth pipe of 16.5 mm of interior diameter. 5.- Load loss by friction in a smooth pipe of 26.5 mm of interior diameter. 6.- Influence of the diameter in the load loss by friction in rough pipes. 7.- Influence of the diameter in the load loss by friction in smooth pipes. 8.- Load loss by friction in smooth and rough pipes. 9.- Friction coefficient in a rough pipe of 17 mm of interior diameter. 10.- Friction coefficient in a rough pipe of 23 mm of interior diameter. 11.- Friction coefficient in a smooth pipe of 6.5 mm of interior diameter. 12.- Friction coefficient in a smooth pipe of 16.5 mm of interior diameter. 13.- Friction coefficient in a smooth pipe of 26.5 mm of interior diameter. 14.- Influence of the diameter in the friction coefficient in rough pipes. 15.- Influence of the diameter in the friction coefficient in smooth pipes. | <ol style="list-style-type: none"> 16.- Friction coefficient in smooth and rough pipes. 17.- Load losses in the inclined seat valve. 18.- Load losses in the floodgate valve. 19.- Load losses in the filter. 20.- Load losses in the membrane valve. 21.- Load losses in an abrupt broadening. 22.- Load losses in the Venturi. 23.- Load losses in the diaphragm. 24.- Load losses in an abrupt contraction. 25.- Load losses in the accessories. 26.- Flow measurements by load loss in a Venturi. 27.- Flow measurements by load loss in a diaphragm. 28.- Flow measurements by means of load loss. 29.- Load losses in a symmetrical bifurcation. 30.- Load losses after two 90° elbows. 31.- Load losses in a T-junction. 32.- Load losses for a 90° elbows. 33.- Load losses on the ball valve. 34.- Load losses for an elbow of 45°. 35.- Load losses in a inclined T-junction. 36.- Study of laminar regime. 37.- Study of turbulent regime. <p>Other possible practices:</p> <ol style="list-style-type: none"> 38.- Filling of the manometers. 39.- Universal graph for the pipe calculation. |
|---|--|

REQUIRED SERVICES

- Water supply and drainage.
- Drainage.

DIMENSIONS & WEIGHTS

- AFT/P dimensions: 2300 x 850 x 1100 mm. approx.
- AFT/P weight: 100 Kg. approx.

RECOMMENDED ACCESSORIES (for AFT/P)

- FME00. Hydraulics Bench.
- OR
- FME00/B. Basic Hydraulic Feed System.

OPTIONAL

AFT/CAL. **Computer Aided Learning Software (Results Calculation and Analysis).**

AVAILABLE VERSIONS

Offered in this catalogue:

- **AFT. Fluid Friction in Pipes, with Hydraulics Bench (FME00).**
- **AFT/B. Fluid Friction in Pipes, with Basic Hydraulic Feed System (FME00/B).**
- **AFT/P. Fluid Friction in Pipes** (only panel).

Offered in other catalogue:

- **AFTC. Computer Controlled Fluid Friction in Pipes, with Hydraulics Bench (FME00).**

* Specifications subject to change without previous notice, due to the convenience of improvements of the product.



C/ Del Agua, 14. Polígono San José de Valderas. 28918 LEGANES. (Madrid). SPAIN.
 Phone: 34-91-6199363 FAX: 34-91-6198647
 E-mail: edibon@edibon.com WEB site: www.edibon.com

REPRESENTATIVE:

