



ENERGY LOSSES IN BENDS



DL DKL182

In order to calculate secondary losses that can be caused by accessories installed in pipes system, it is possible to compare the pressure difference between the upstream and downstream measuring point of the element involved.

When we want to know the pressure loss that occurs between two pressure measuring points in different diameter pipes, we should take into consideration that all static pressure difference does not correspond to pressure losses: a part is due to the transformation from static to dynamic pressure by increasing speed.

The system includes all the possible configurations with 90° elbows, besides abrupt widening and narrowing and a gate valve. Students can read simultaneously these losses through a water column manometer clearly displaying the difference between different types of elbows, abrupt widening and narrowing, and valve.

In addition, the system includes an electronic differential pressure gauge which allows wider range measurement of the head loss produced in the gate valve with different openings. The flow measurements can be done using the volumetric reservoir of the hydraulic bench (required and not supplied with this item), which is also possible to study the relation between pressure drop and fluid velocity.

PERFORMABLE EXPERIMENTS

- Study of the relationship between load losses and the fluid velocity in the piping.
- Measurement and testing of secondary load losses produced in installed elements such as:
 - Elbows 90°
 - Curves 90°
 - Long curves 90°
 - Elbows 45°
 - Abrupt widening
 - Abrupt narrowing
 - Gate valve



FLUID MECHANICS



- Calculating "K" coefficients of loss corresponding to each of the elements mentioned above.
- Using different types of gauges:
 - Water column
 - Electronic differential pressure gauge

TECHNICAL DATA

Pipe diameters:

- Main pipe:
Inner $\varnothing = 21.2\text{mm}$; Outer $\varnothing = 25\text{mm}$
- Narrowing / abrupt widening:
Inner $\varnothing = 27.2\text{mm}$; Outer $\varnothing = 32\text{mm}$

Components to study:

- Long curves 90°
- Abrupt widening
- Abrupt narrowing
- Elbows 90°
- Curves 90°
- Gate valve
- Short curve 90°
- Elbows 45°

Gauges:

- Manometer with 12 water columns and 440mm tubes
- Electronic differential pressure gauge

Additional features:

The system includes a hand pump for height adjustment of the multi-tube gauge reading.

Requirements:

Hydraulic bench DL DKL014, not included in the system.