

GUNT
Fluid Line

HM 250 Fundamentals of fluid mechanics

digital teaching-learning concept



HM 250 Fundamentals of fluid mechanics and HM 250.06 Free discharge

Digital media, real experiments

- touch panel as HMI
- PLC to manage measuring functions and representations
- menu-driven experiment setup, measurement and evaluation
- data transfer via USB, for versatile external use, e.g. screenshots, tables and charts in Excel
- WLAN Router for parallel display of data on up to 10 terminals: laptop, tablet, smartphone

Demonstration wanted?
We would be happy to visit you on site.

Overview

HM 250 Fundamentals of fluid mechanics

HM 250
Fundamentals of fluid mechanics

Info

HM 250 Fundamentals of fluid mechanics

HM 250.06 Free discharge

The trajectory parabola is determined from the previously calculated flow velocity. Using equations of motion and time, we can determine the distances in the x and y direction.

$$x = t \cdot c_1 \quad y = \frac{1}{2} \cdot g \cdot t^2$$

t time, c flow velocity, g gravitational acceleration

After transformation, for y we get:

$$y = \frac{1}{4} \cdot \frac{x^2}{h_1}$$

h elevation

Experiment preparation

HM 250 Fundamentals of fluid mechanics

HM 250.06 Free discharge

1. Connect hoses

Experiment overview

HM 250 Fundamentals of fluid mechanics

HM 250.06 Free discharge

Record

Flow velocity: 1.40 L/min

Pressure: 300.0 mbar_{H2O}

Screenshot

HM 250 Fundamentals of fluid mechanics

HM 250.06 Free discharge

For application of the energy equation in the concrete case of free flow, three suitable positions are chosen. These positions have known parameters or measured values.

Position 1: Surface of the water column
 a, ambient pressure, b, elevation = water level, c, flow velocity = 0

Position 2: Upstream of nozzle
 a, ambient pressure = pressure of the water column, b, water level = 0 (reference level), c, flow velocity = 0

Position 3: Free jet at the outlet of the nozzle
 a, ambient pressure, b, water level = 0 (reference level), c, flow velocity = variable sought

Help

HM 250 Fundamentals of fluid mechanics

HM 250.06 Free discharge