

FLUID MECHANICS

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FLUID MECHANICS

The fluid mechanics range offers a wide scope of teaching equipment covering the complete range of course in fluid dynamics

The base module with closed water circuit and volumetric measurement allows the tutors to swap individually mounted experiment modules such as Bernoulli's principle, flow over different weirs, energy losses in pipes and pipe elements, horizontal and vertical flow measurement and many more..... reducing the lab space and cost for each experiment. This self contained bench (base module) comes with wheels to provide easy mobility.

Flow and sediment channels Comes with different cross sections and lengths demonstrating the mechanics of flow enables the practical teaching and demonstration of phenomenon such as critical or subcritical flow, hydraulic jump, dune formation and many more with the help of accessories available to be used with flow and sediment channels.



Note: Specifications are subject to change.

ORDER CODE - HD150 - BASE MODULE FOR FLUID MECHANICS

A base module for experiments in fluid mechanics containing large and small stepped measuring tanks for volumetric measurement of large and small flow rates. The complete unit is closed circuit comes with wheels for easy mobility.

**ORDER CODE - HD150.01****PIPE FRICTION FOR LAMINAR/TURBULENT FLOW**

Measurement of pressure losses in laminar /turbulent flow

Determining the critical Reynolds's number and pipe friction factor

Comparing the actual pipe friction factor with theoretical friction factor

ORDER CODE - HD150.03 - PLATE WEIRS (NOTCHES)

Discharge Measurement in open channel using three different measuring weirs

HD150 Hydraulic Bench required for experimentation.



Note: Specifications are subject to change.

ORDER CODE - HD150.04 - CENTRIFUGAL PUMP

Determining the characteristics of a typical centrifugal pump.

**ORDER CODE - HD150.05****HYDROSTATIC PRESSURE IN LIQUIDS**

Investigation of fluid pressure on vessel walls.

ORDER CODE - HD150.06**STABILITY OF FLOATING BODIES**

Determination of metacenter and buoyancy using a rectangular hull section



Note: Specifications are subject to change.

ORDER CODE - HD150.07 - BERNOULLI'S PRINCIPLE

Static pressure and total pressure distribution along the venturi nozzle

Recommended for water supply

HD150 - HYDRAULIC BENCH

**ORDER CODE - HD150.08 - MEASUREMENT OF JET FORCES**

Demonstration of the principle of linear momentum and impact forces on interchangeable deflectors with different deflection angles.

Recommended for water supply

HD150 - HYDRAULIC BENCH

ORDER CODE - HD150.09 - HORIZONTAL FLOW FROM A TANK

Recording the trajectory of the water jet at different outlet velocities.

Recommended for water supply

HD150 - HYDRAULIC BENCH



Note: Specifications are subject to change.

ORDER CODE - HD150.10 VERTICAL FLOW FROM A TANK

Determination of different flow measuring methods and determining the flow coefficients for different flow meters.

Recommended for water supply

HD150 - HYDRAULIC BENCH

**ORDER CODE - HD150.11 - LOSSES IN A PIPE SYSTEM**

pressure losses in pipes, piping elements and fittings

how the flow velocity affects the pressure loss

determining resistance coefficients

opening characteristics of angle seat valve and gate valve

familiarisation with various measuring objects for determining flow rate:

Venturi nozzle

orifice plate flow meter and measuring nozzle

**ORDER CODE - HD150.12 - VORTEX APPARATUS**

Recognition of surface profiles for free and forced vortex.

Recommended for water supply

HD150 - HYDRAULIC BENCH

Note: Specifications are subject to change.

ORDER CODE - HD150.13
METHODS OF FLOW MEASUREMENT

Comparison of different flow measuring methods and determining the flow coefficients for different flow meters.

HD150 - HYDRAULIC BENCH



ORDER CODE - HD150.14 HYDRAULIC RAM

Formation and effect of water hammer. Pumping of water using hammer
Recommended for water supply

HD150 - HYDRAULIC BENCH



ORDER CODE - HD150.15

SERIES AND PARALLEL CONFIGURATION OF PUMPS

Determining the characteristics curve and hydraulic power output and comparison of series and parallel operating modes.

Recommended for water supply.

HD150 - HYDRAULIC BENCH



Note: Specifications are subject to change.

ORDER CODE - HD150.16 - OSBORNE REYNOLD'S EXPERIMENT

Visualization of laminar and turbulent flow

Recommended for water supply

HD150 - HYDRAULIC BENCH

**ORDER CODE - HD150.17****OPERATING PRINCIPLES OF PELTON TURBINE**

An impulse turbine with adjustable nozzle ; determination of characteristics curves and efficiency.

Recommended for water supply

HD 150 - HYDRAULIC BENCH

ORDER CODE - HD150.18**OPERATING PRINCIPLES OF FRANCIS TURBINE**

A Reaction turbine with adjustable guide vanes ; determination of characteristics curves and efficiency.

Recommended for water supply

HD150 - HYDRAULIC BENCH



Note: Specifications are subject to change.

ORDER CODE - HD150.19

ENERGY LOSSES IN PIPING ELEMENTS

Pressure losses in various pipe fittings and valves.

Recommended for water supply

HD 150 - HYDRAULIC BENCH



ORDER CODE - HD150.20

OPERATING PRINCIPLES OF KAPLAN TURBINE

Demonstrating and studying the operational behavior and characteristics of a Kaplan turbine.

Recommended for water supply

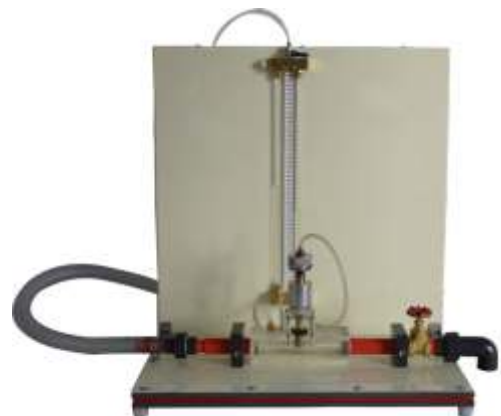
HD150 - HYDRAULIC BENCH

ORDER CODE - HD150.21 - PITOT STATIC TUBE MODULE

Demonstrate the pitot static tube operation as measuring instrument and to draw the velocity profiles in a pipe.

Recommended for water supply

HD150 - HYDRAULIC BENCH



Note: Specifications are subject to change.

HD 150.22- VISUALISATION OF STREAMLINES IN OPEN CHANNEL

Flow around various drag bodies and incident flow of weirs, ink used as contrast medium

Recommended for water supply

HD 150 - HYDRAULIC BENCH



HD 150.23- CAVITATION DEMONSTRATOR

Visualization of the formation of vapor bubbles in a venture nozzle and to find the cavitation number.

Recommended for water supply

HD 150 - HYDRAULIC BENCH



HD 150.24- PIPE NETWORK APPARATUS

Pressure losses at various piping elements and pipe networks;
parallel and series connection of pipe sections

Recommended for water supply

HD 150 - HYDRAULIC BENCH



Note: Specifications are subject to change.

ORDER CODE - HD150.126 - CALIBRATION OF ROTAMETER

Flow measurement

To plot the characteristics and calibration curve

**ORDER CODE - HD150.27
FUNDAMENTAL OF PRESSURE MEASURE-MENT**

Measurement of positive and negative pressure with different measuring devices.

Note: Specifications are subject to change.

ORDER CODE - TF101 - VAPOUR PRESSURE OF WATER - MARCET BOILER

Pressure and temperature measurement in a steam boiler

**ORDER CODE - TF102
FUNDAMENTAL OF TEMPERATURE MEASUREMENT**

Experimental introduction to temperature measurement:
methods, areas of application, characteristics

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03.06.2024 **Tesca Technologies Pvt. Ltd.**

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ORDER CODE - HD115 - HYDROSTATIC BENCH

Experiments on buoyancy, density, capillarity etc. ;
various methods of pressure measurement

**ORDER CODE - HD122 - LOSSES IN PIPE**

fundamentals of flow measurement
fundamentals of pressure measurement
determination of the friction factor for different pipe materials
and diameters
resistance coefficients of pipe bends, enlargements and contrac
tions
pressure losses and opening characteristics of valves and fittings

**ORDER-CODE - HD126****DETERMINATION OF SETTLING VELOCITY (STOKE'S LAW)**

Vertically falling body in liquid using specimens of different
sizes and different materials



Note: Specifications are subject to change.

ORDER CODE - HD140 - ADVANSED HYDROLOGICAL

investigating transient processes

effect of rainfall of varying duration on the discharge

storage capacity of a soil

investigating steady processes

seepage flow

effects of wells on the groundwater level over time

flow behavior of rivers, obstacles in the river bed, sediment transport in rivers

**ORDER CODE - HM142 - VISUALISATION OF SEEPAGE FLOW**

determining flow nets in permeable media graphically

streamlines under a sheet pile

streamlines through an earth dam

drainage at an open ditch

determining the pressure curve at a foundation

determining the pressure curve at a retaining wall

groundwater levels over time in various models

Note: Specifications are subject to change.

ORDER CODE - HD143

TRANSIENT DRAINAGE PROCESSES IN RESERVOIRS

Demonstration of the function of a rainwater retention basin and a dam



ORDER CODE - HD152 - POTENTIAL FLOW

Visualization of streamlines in a Hele-Shaw cell using ink as contrast medium

Note: Specifications are subject to change.

ORDER CODE - HD156 - PIPE SURGE AND WATER HAMMER APPARATUS

Transient flow conditions in pipe systems by means of experimentation

demonstrating water hammer in pipes

determining the wave propagation velocity in water

understanding how a surge chamber works natural frequency in the surge chamber



Note: Specifications are subject to change.

ORDER CODE - HD157 - DEMONSTRATION INFILTRATION APPARATUS

- Demonstration of the effect of crusting on infiltration
- Understand the effects of soil texture and structure on infiltration
- Understand the effects of existing soil moisture conditions on infiltration
- Demonstration of relationship between soil type and infiltration and penetration rates
- Demonstration of the relationship between soil particle size and infiltration
- The effect of organic matter content on infiltration and penetration rate
- The effect of non-homogeneous soil strata on infiltration and penetration rates
- The effect of moisture content on infiltration and penetration rates
- The effect of straw mulch on infiltration rate

**ORDER CODE - HD158****OPEN CHANNEL SEDIMENT TRANSPORT**

- Observation of bed formation;
- visualization of flow with contrast medium

Note: Specifications are subject to change.

ORDER CODE - HD159 - EXPERIMENTAL FLUME 100 X 300 mm

Experimental section with lengths of 2.5m or 5m available,

Closed water circuit and inclination adjustment

uniform and non-uniform discharge

flow formulae

flow transition (hydraulic jump)

energy dissipation (hydraulic jump, stilling basin)

flow over control structures: weirs (sharp- crested, broad-crested, ogee-crested),

discharge under gates

flow-measuring flumes

local losses due to obstacles

transient flow: waves

vibrating piles

sediment transport



Note: Specifications are subject to change.

ORDER CODE - HD160 - EXPERIMENTAL FLUME (309 X 450MM)

Experimental section for performing flow experiments in open flumes with lengths of 5m, 7,5m, 10m or 12,5m Available, closed water circuit and inclination adjustment

WITH THE AVAILABLE ACCESSORIES FOLLOWING EXPERIMENTS ARE POSSIBLE

uniform and non-uniform discharge

flow formulae

flow transition (hydraulic jump)

energy dissipation (hydraulic jump, stilling basin)

flow over control structures: weirs (sharp-crested, broad-crested, ogee-crested)

flow over control structures: discharge under gates

flow-measuring flumes

local losses due to obstacles

transient flow: waves

vibrating piles sediment transport



Note: Specifications are subject to change.

ORDER CODE - HD161 - EXPERIMENTAL FLUME (409 X 500MM)

Experimental section for performing flow experiments in open flumes with lengths of 5m, 7,5m, 10m or 12,5m Available, closed water circuit and inclination adjustment

WITH THE AVAILABLE ACCESSORIES FOLLOWING EXPERIMENTS ARE POSSIBLE

uniform and non-uniform discharge

flow formulae

flow transition (hydraulic jump)

energy dissipation (hydraulic jump, stilling basin)

flow over control structures: weirs (sharp-crested, broad-crested, ogee-crested)

flow over control structures: discharge under gates

flow-measuring flumes

local losses due to obstacles

transient flow: waves

vibrating piles sediment transport



Note: Specifications are subject to change.

ORDER CODE - HD162 - EXPERIMENTAL FLUME (600 X 800)

Experimental section for performing flow experiments in open flumes of 16m, 21 m length, closed water circuit, inclination adjustment.

Features:

experimental section with transparent side walls, length 16m, 21m.

homogeneous flow through carefully designed inlet element

control with PLC via two touch panels models from all fields of hydraulic engineering available as accessories



Accessories available as optional

- | | | |
|-----------------------|---------------------------------|-------------------------------------|
| 1. Sluice gate | 10. culvert | 19. closed sediment circuit |
| 2. Radial gate | 11. set of piers | 20. sediment trap |
| 3. Set of palte weirs | 12. flume bed with pebble stone | 21. sediment feeder |
| 4. Broad crested weir | 13. venture flume | 22. level gauge |
| 5. Crump weir | 14. parshall flume | 23. digital level gauge |
| 6. Siphon | 15. trapezoidal flume | 24. velocity meter |
| 7. rake | 16. wave generator | 25. pitot static tube |
| 8. ogee crested weir | 17. set of beaches | 26. multi tube manometers |
| 9. Sill | 18. vibrating piles | 27. electronic pressure measurement |
| | | 28. instrument carrier |

Note: Specifications are subject to change.

HD 163- EXPERIMENTAL FLUME (1000X 800MM)

Experimental section for performing flow experiments in open flumes of 16m, 21 m length, closed water circuit, inclination adjustment.

Features:

experimental section with transparent side walls, length 16m, 21m.

homogeneous flow through carefully designed inlet element

control with PLC via two touch panels models from all fields of hydraulic engineering available as accessories



Accessories available as optional

- | | | |
|-----------------------|---------------------------------|-------------------------------------|
| 1. Sluice gate | 10. culvert | 19. closed sediment circuit |
| 2. Radial gate | 11. set of piers | 20. sediment trap |
| 3. Set of palte weirs | 12. flume bed with pebble stone | 21. sediment feeder |
| 4. Broad crested weir | 13. venture flume | 22. level gauge |
| 5. Crump weir | 14. parshall flume | 23. digital level gauge |
| 6. Siphon | 15. trapezoidal flume | 24. velocity meter |
| 7. rake | 16. wave generator | 25. pitot static tube |
| 8. ogee crested weir | 17. set of beaches | 26. multi tube manometers |
| 9. Sill | 18. vibrating piles | 27. electronic pressure measurement |
| | | 28. instrument carrier |

Note: Specifications are subject to change.

ORDER CODE - HD167 - GROUND WATER FLOW

determining the groundwater level
lowering of groundwater level via two wells
groundwater flow on excavation pits groundwater studies under
concentric load on the substrate

**ORDER CODE - HD168 - SEDIMENT TRANSPORT IN RIVER COURSES**

Investigation of sediment migration with and without
structures

ORDER CODE - HD169 - SEPARATION SEDIMENTATION IN TANKS

basic principle for the separation of solids from
suspensions in a sedimentation tank
determine the hydraulic loading rate
influence of the following parameters on the
separation process:
concentration of solids
flow rate
flow velocity in the inlet
water level in the sedimentation tank

investigation of the flow conditions
how lamellas affect the sedimentation process

Note: Specifications are subject to change.

ORDER CODE - HD170 - OPEN WIND TUNNEL

experiments with accessories
 determine drag and lift coefficients for different models
 pressure distribution on bodies immersed in a flow
 boundary layer analysis
 investigation of flutter
 wake measurement
 in conjunction with the fog generator
 visualization of streamlines

ACCESSORIES AVAILABLE AS OPTIONA ITEMS

HD170.01	PITOT STATIC TUBE
HD170.02	BOUNDARY LAYER ANALYSIS WITH PITOT TUBE
HD170.03	TWO COMPONENT FORCE SENSOR
HD170.04	THREE COMPONENT FORCE SENSOR
HD170.05	FOG GENERATOR FOR FLOW VISUALISATION
HD170.06	SYSTEM FOR DATA ACQUISITION
HD170.07	ELECTRONIC PRESSURE MEASUREMENT FOR WIND TUNNEL
HD170.08	ELECTRONIC DISPALCEMENT MEASUREMENT
HD170.09	DIFFERENTIAL PRESSURE MANOMETER
HD170.10	ACCESSORIES FOR DRAG FORCE
HD170.11	ACCESSOTIES FOR LIFT FORCE



Note: Specifications are subject to change.

ORDER CODE - HD172 - SUPERSONIC WIND TUNNEL

pressure curves in supersonic nozzles (Laval nozzle)

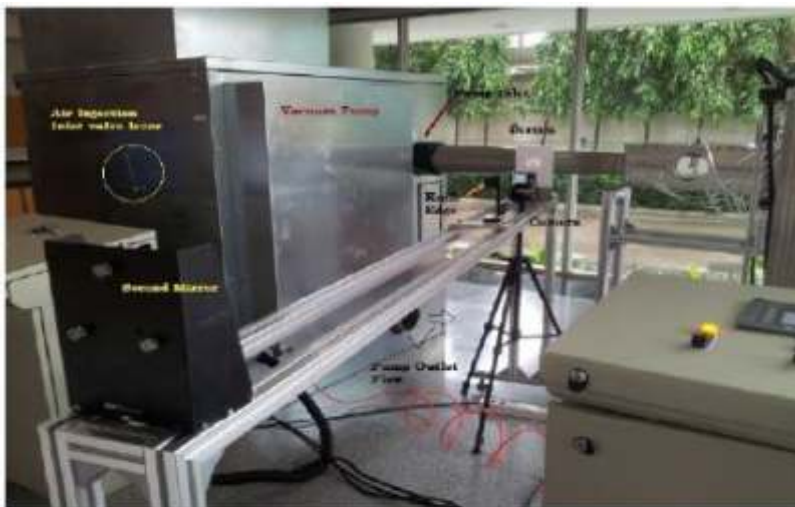
pressure curves and losses in tunnel flows with Mach >1

observe shock waves in drag bodies using Schlieren optics

determining the Mach number from the angle of the shock

waves

comparison of theory and experiment



Note: Specifications are subject to change.



ORDER CODE - HD225 - AERODYNAMIC TRAINER

Together with appropriate accessories: experiments from the field of flow around bodies

velocity measurement of flows with Pitot tube

boundary layer analysis on a flat plate with flow along the plate

drag of bodies

demonstration of the Coanda effect

visualisation of streamlines

together with appropriate accessories: experiments from the field of steady incompressible flow

velocity measurement of flows with Pitot tube and Pitot static tube

free jets

flow in a pipe elbow

proof of Bernoulli's principle



ACCESSORIES FOR AERODYNAMIC TRAINER (OPTIONAL AVAILBLE)

HD225.01	BOUNDARY LAYERS
HD225.02	DRAG FORCES
HD225.03	COANDA EFFECT
HD225.04	VISUALISATION OF STREAMLINES
HD225.05	BERNOULLI'S PRINCIPLE
HD225.06	FLOW IN A PIPE BEND
HD225.07	FREE JET

ORDER CODE - HD226 - SMOKE TUNNEL FOR FLOW VISUALISATION

visualization of streamlines

flow around or through differently shaped models

flow separation and turbulence

stall as a function of the angle of attack

Note: Specifications are subject to change.