

HM 165

Studies in Hydrology



- * Investigation of seepage flow and groundwater flows in soils
- * Experimental section with inclination adjustment
- * Investigation of steady and transient processes
- * Closed water circuit

Technical Description

In civil engineering, studies in hydrology are conducted in connection with the design, construction and operation of hydraulic engineering systems and water management functions. These studies focus on topics such as seepage and flow of water in the soil and the use of groundwater resources.

HM 165 can be used to study seepage and groundwater flows after precipitation. In particular, permeability and storage capacity of soils can be clearly observed. Variable precipitation density and areas and different groundwater feed and discharge possibilities allow a wide variety of experiments.

The core element of the trainer is a sand-filled, stainless steel experiment tank with inclination adjustment. To illustrate groundwater flow, the water is supplied via two side-mounted chambers. To study precipitation, a precipitation device is available. The precipitation device consists of two groups of four nozzles. There are two wells with perforated tubes or two side-mounted chambers with drainage screens available for the investigation of various drainage systems.

At the bottom of the experiment tank there are measuring connections to detect groundwater levels. A mirrored arrangement of the measuring connections allows for a finer resolution of the measurement.

Groundwater levels are displayed on a 19-fold tube manometer. The water supply is controlled by a needle valve and read on a flow meter. The water drain is determined by a measuring weir.

HM 165 contains a closed water circuit with storage tank and pump.

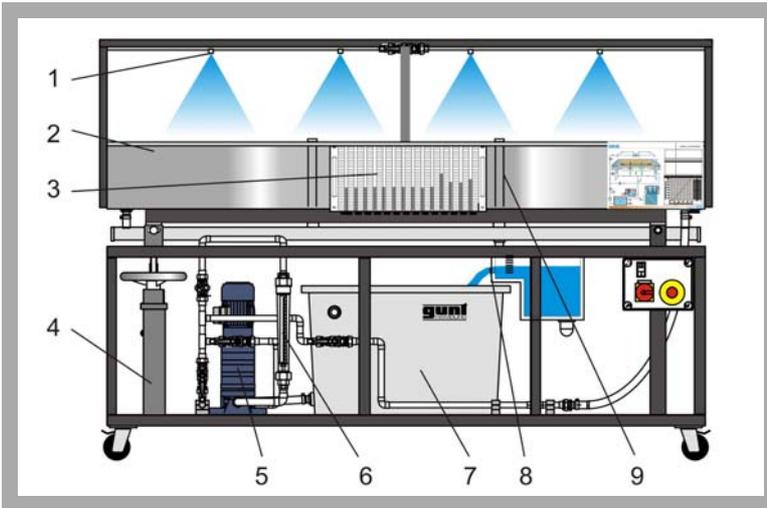
The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

Learning Objectives / Experiments

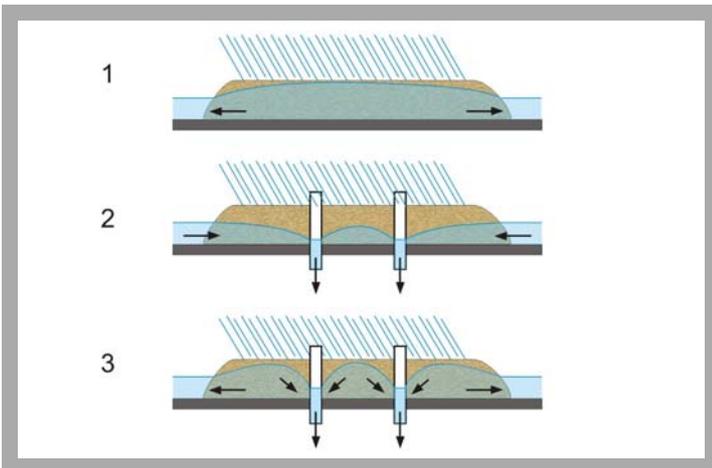
- investigating transient processes
 - * effect of precipitation of varying duration
 - * effect of different soil saturation levels
 - * storage capacity of a soil
- investigating steady processes
 - * investigating the seepage flow
 - * studying how wells affect the groundwater level over time
 - * groundwater flow in inclined, impermeable layer
- investigating the groundwater level of an island

HM 165

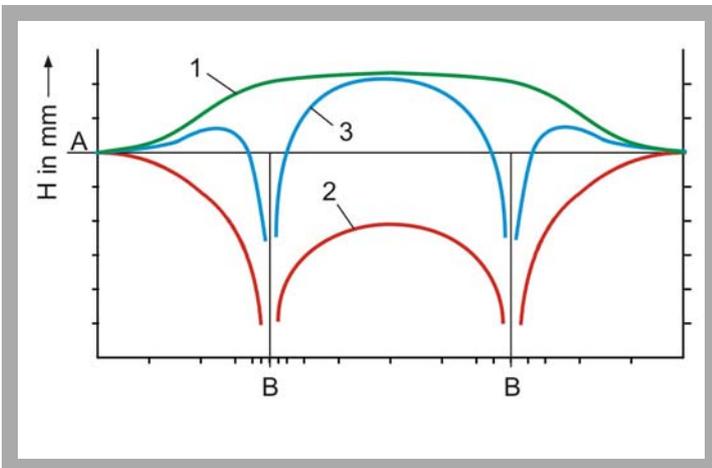
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1 nozzle, 2 experimental section, 3 tube manometer, 4 inclination adjustment, 5 pump, 6 flow meter, 7 storage tank, 8 measuring weir in the measuring tank, 9 wells with perforated tube



Investigating the groundwater level of an island
1 fresh water supply by precipitation, no risk of salinisation, 2 excessive fresh water extraction from wells, risk of salinisation, 3 balance between supply and moderate extraction, no risk of salinisation



Measurement result for groundwater level over time of an island
1 to 3: groundwater levels over time for the example above; A sea level, B wells, H groundwater level

Specification

- [1] investigation of seepage flows and groundwater levels over time
- [2] closed water circuit
- [3] stainless steel experiment tank with transparent splash guard
- [4] experimental section separated from inlet and outlet chamber by screens
- [5] precipitation device with eight nozzles, adjustable precipitation area
- [6] water drain and two wells
- [7] 19 measuring connections with filters at the bottom of the experiment tank
- [8] stainless steel storage tank with level indicator
- [9] water inlets and outlets can be adjusted separately via valves
- [10] instruments: tube manometer, rotameter (inlet) and measuring weir (outlet) in the measuring tank

Technical Data

- Experimental section
 - area: 2x1m², depth: 0,2m
 - max. sand filling: 0,3m³
 - inclination adjustment: -2,5...5%
- Precipitation device
 - 8 nozzles, switchable in 2 groups of 4 nozzles
 - flow rate: 1...4,7L/min, square spray pattern
- Pump
 - power consumption: 0,55kW
 - max. flow rate: 1.500L/h
- Storage tank, stainless steel: content 180L
- Tube manometer: 19-fold, 300mmWC

- Measuring ranges
- flow rate (inlet): 150...1.600L/h

Dimensions and Weight

LxWxH: 2.400x1.100x1.800mm
Empty weight: approx. 250kg

Required for Operation

230V, 50/60Hz, 1 phase or 120V, 60Hz/CSA, 1 phase;
coarse sand, grain size 1...2,5mm

Scope of Delivery

- 1 trainer
- 1 set of instructional materials

Order Details

070.16500 HM 165 Studies in Hydrology

