HM 165
Studies in hydrology

2E

Description

- **precipitation-drain relationship**
- **seepage flows and groundwater flows in soils**
- **supply and drain over a large area**

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. Variable precipitation density and areas and different groundwater supply and drain possibilities allow a wide variety of experiments.

HM 165 contains a closed water circuit with storage tank and pump. The core element is a sand-filled, stainless steel experiment tank with inclination adjustment. To study precipitation, a precipitation device is available. The precipitation device consists of two groups of four nozzles. Water can flow in (groundwater) or out (drainage) via two chambers on the side. The experiment tank is separated from the chambers by fine mesh screens. To study the lowering of groundwater, two wells with open seam tubes are available. Water supply and water drain can be opened and closed, thus allowing a wide variety of experimental conditions.

At the bottom of the experiment tank there are measuring connections to detect groundwater levels, which are displayed on 19 tube manometers. The water supply is controlled by a valve and read on a flow meter. The water drain is determined by a measuring weir.

Learning objectives/experiments

- investigating transient processes
  - effect of rainfall of varying duration on the discharge
  - storage capacity of a soil
- investigating steady processes
  - investigating seepage flow
  - effects of wells on the groundwater level over time

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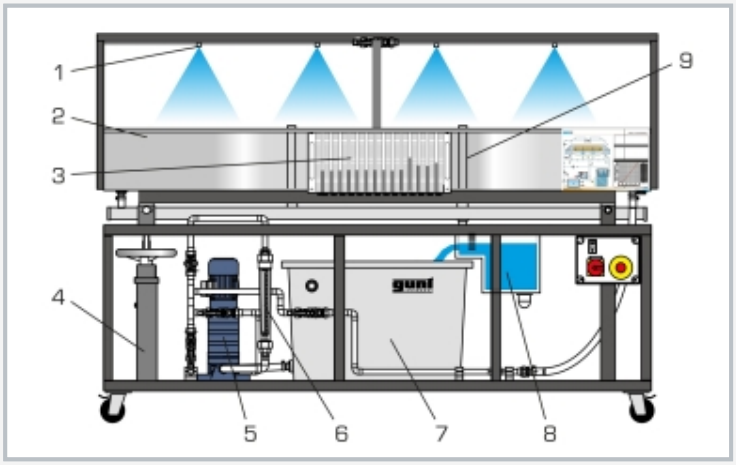
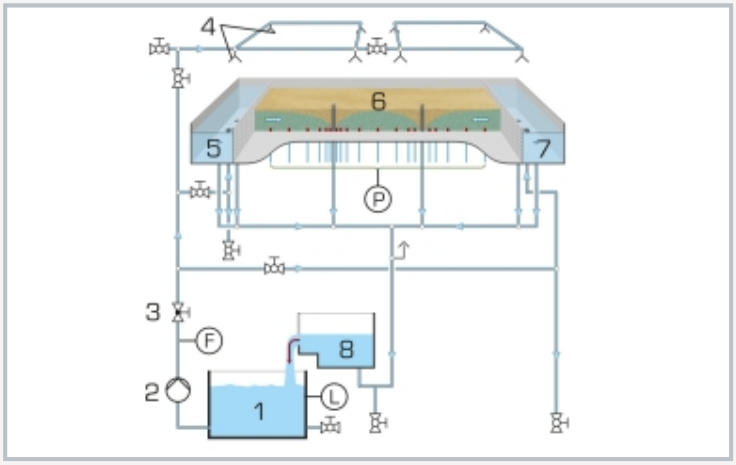
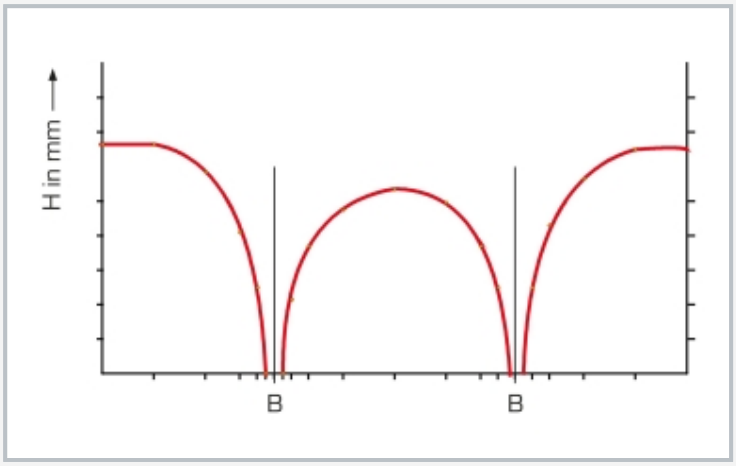


1 nozzle of the precipitation device, 2 experiment tank, 3 tube manometers, 4 inclination adjustment, 5 pump, 6 flow meter (supply), 7 storage tank, 8 measuring tank (drain), 9 well



1 storage tank, 2 pump, 3 valve for setting the flow rate, 4 nozzle, 5 chamber, 6 experiment tank, 7 chamber, 8 measuring tank; L level, F flow rate, P pressure



Lowering of groundwater over 2 wells; B well, H groundwater level

Specification

[1] investigation of precipitation-discharge relationships, storage capacity of soils, seepage flows and groundwater flows
[2] closed water circuit
[3] inclinable stainless steel experiment tank contains 19 measuring connections to detect groundwater levels, transparent splash guard and screens for separating the chambers
[4] 2 wells with open seam tubes in the experiment tank
[5] precipitation device with 8 nozzles, adjustable
[6] water supplies and drains can be selected individually
[7] transparent measuring tank (flow)
[8] instruments: tube manometers (groundwater), flow meter (supply) and measuring weir in the measuring tank (drain)

Technical data

Experiment tank
- area: 2mx1m, depth: 0,2m
- max. sand filling: 0,3m^3
- inclination adjustment: -2,5...5%

Precipitation device
- 8 nozzles, switchable in 2 groups of 4 nozzles
- flow rate per nozzle: 1...4,7L/min, square spray pattern

Pump
- power consumption: 0,55kW
- max. flow rate: 2000L/h

Storage tank, stainless steel: content 180L

Measuring ranges
- pressure: 19x 0...300mmWC
- flow rate:
  - 1x 150...1700L/h (water supply)
  - 1x 0...1700L/h (water drain)

230V, 50Hz, 1 phase
230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase
UL/CSA optional
LxWxH: 2400x1100x1800mm
Empty weight: approx. 310kg

Required for operation

sand (1...2mm grain size)

Scope of delivery

1 trainer
1 set of instructional material