

HM 145

Advanced Hydrological Investigations



- * **Seepage flows and groundwater flows in soils**
- * **Investigation of sediment transport**
- * **Closed water circuit**

Technical Description

The HM 145 trainer offers studies in hydrology such as seepage and movement of the water in soils. In addition, river courses and surface water are investigated. Furthermore, sediment transport and siltation are also presented in the context of flow obstacles. 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 experiment tank with inclination adjustment. The water is supplied either via a feed chamber or a precipitation device, which uses a timer to allow time-defined precipitation.

The experimental section is separated from the feed and discharge chambers by fine mesh screens. There are two wells with perforated tubes or a discharge chamber with drainage screen available for the investigation of various drainage systems. Additionally, storm overflows can be placed in the discharge chamber to influence the ground water level in the experimental section. All water feeds and discharges can be adjusted separately via valves.

Three different models for pillars also allow the investigation of flow around bodies, erosion and siltation in the river bed.

In the experimental section there are measuring connections to detect groundwater levels. Groundwater levels are displayed on a 19-fold tube manometer. The water supply is controlled by valves and read at two flow meters with different measuring ranges.

The water drain is determined by a measuring weir. The amount of sediment transported is measured with the aid of a balance.

The measured values are read from digital displays and can at the

same time be transmitted via USB directly to a PC where they can be analysed using the software included.

HM 145 contains a closed water circuit with storage tank and pump.

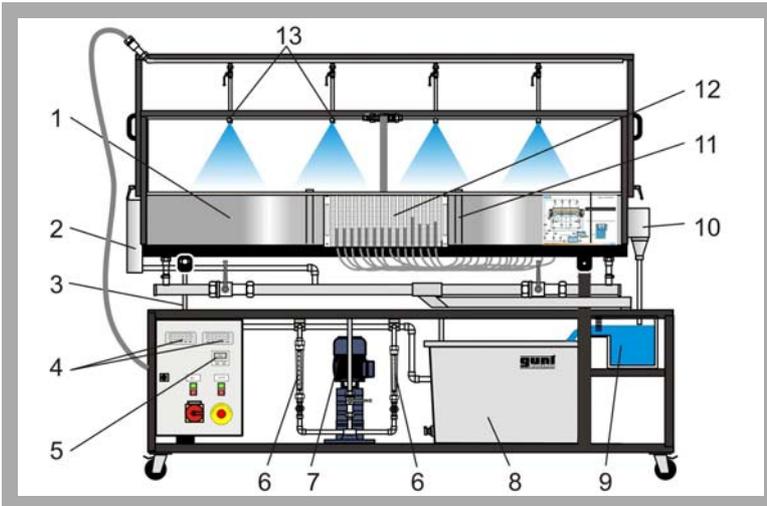
The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

Learning Objectives / Experiments

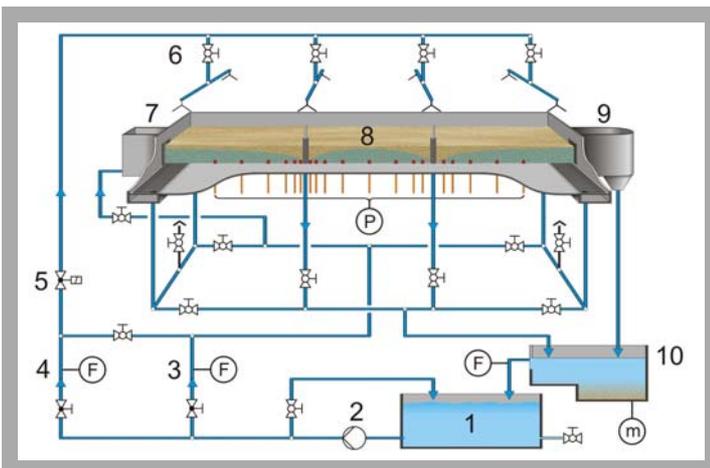
- effect of precipitation of varying duration on soils with different saturation
- investigating the seepage flow
- investigating the storage capacity of a soil
- studying how wells affect the groundwater level over time
- flow behaviour of rivers, obstacles in the river bed, sediment transport in rivers

HM 145

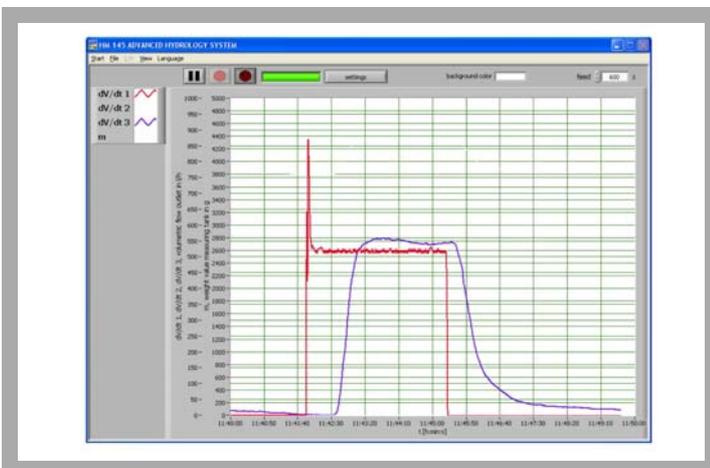
Advanced Hydrological Investigations



1 experiment tank, 2 feed chamber, 3 inclination adjustment, 4 mass and flow rate display, 5 timer, 6 flow meter, 7 pump, 8 storage tank, 9 measuring weir in the measuring tank, 10 discharge chamber, 11 well with perforated tube, 12 tube manometer, 13 nozzle



1 storage tank, 2 pump, 3 water supply flow meter, 4 water drain flow meter, 5 solenoid valve with timer, 6 nozzle, 7 feed chamber, 8 experiment tank, 9 discharge chamber, 10 measuring tank; m mass, F flow rate, P pressure



Software screenshot: water drain for persistent rain with saturation of the soil: red precipitation, blue drain

Specification

- [1] investigation of seepage flows, groundwater levels over time and sediment transport
- [2] closed water circuit
- [3] stainless steel experiment tank with transparent splash guard
- [4] fine-mesh screen to separate the experimental section from the inlet and outlet chamber
- [5] 2 wells with perforated tubes in the experimental section
- [6] water feeds and discharges can be adjusted separately via valves
- [7] precipitation device with eight nozzles, adjustable
- [8] precipitation time can be adjusted via timer
- [9] 19 measuring connections with filters to detect the groundwater levels at the bottom of the experiment tank
- [10] transparent measuring tank with measuring weir and force sensor to detect the amount of sediment transported
- [11] instruments: tube manometer, 19-fold, rotameters (2x at the feed) and measuring weir (1x at the discharge) in the measuring tank
- [12] GUNT software for data acquisition via USB under Windows XP or Windows Vista

Technical Data

- Experiment tank, inclination adjustment: -5...5%
- area: 2x1m², depth: 0,2m, max. sand filling: 0,3m³
- Precipitation device, adjustable 4x 2 nozzles
- flow rate: 1...4,7L/min, square spray pattern
- Pump
- power consumption: 0,55kW
- max. flow rate: 1.500L/h
- Storage tank (plastic): content 220L
- Models: plastic pillars
- round: 30x100mm, square: 30x30x100mm
- oval: 60x30x100mm

Measuring ranges

- tube manometer: 19-fold, 300mmWC
- flow rate (inlet): 0...1.050L/h, 0...320L/h
- flow rate (drain): 0...1.000L/h
- mass: 0...5.000g

Dimensions and Weight

LxWxH: 2.300x1.100x1.950mm
Empty weight: approx. 250kg

Required for Operation

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

Scope of Delivery

- 1 trainer, 3 models (pillars)
- 1 CD with GUNT software + USB cable
- 1 set of instructional material

Order Details

070.14500 HM 145 Advanced Hydrological Investigations