

# HM 167

## Groundwater flow



### Description

- investigation of groundwater flows
- demonstration of lowering of groundwater
- investigation of excavation pits

Groundwater flows consider, among other things, the extraction of groundwater from wells and excavation pits. An understanding of the hydrological principles of groundwater flow is useful when designing reliable structures such as excavation pits or drainage systems.

HM 167 allows three-dimensional investigations of groundwater flows. The trainer consists of a tank with a sand filling. Various models can be placed in the sand bed.

The water is supplied to the tank via two horizontal open-seam tubes that can be activated separately via valves. This results in various experiment possibilities with flowing groundwater. The investigation of various extractions is facilitated by two wells with open-seam tubes, which are also activated individually via valves. Three different models allow the study of excavation pits.

At the bottom of the tank there are orthogonally arranged measuring connections to detect groundwater levels. Groundwater levels are displayed on 19 tube manometers.

### Learning objectives/experiments

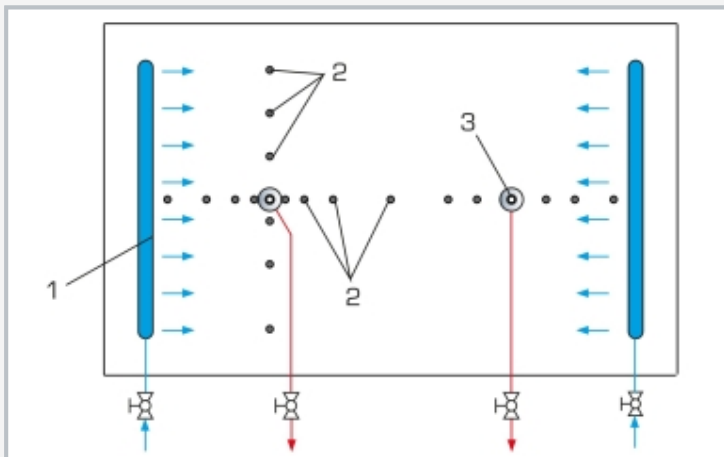
- determining the groundwater level
- lowering of groundwater level via two wells
- groundwater flow on excavation pits
- groundwater studies under concentric load on the substrate

# HM 167

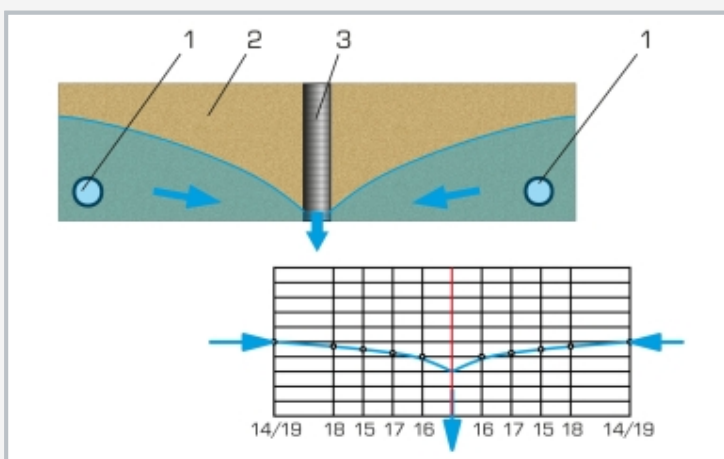
## Groundwater flow



1 tank, 2 water supply, 3 water drain, 4 models, 5 water drain, 6 water supply, 7 tube manometers, 8 water drain via open-seam tube (well)



Arrangement of the measuring points and wells  
1 water inlet via open-seam tube, 2 measuring points, 3 water drain via open-seam tube (well); blue: water inlet, red: water drain



Groundwater level over time with one well: 1 water inlet via open-seam tube, 2 sand bed, 3 well with open-seam tube; Diagram: blue: groundwater level over time, red: well, 14-19 measuring points on the bottom in the sand bed

### Specification

- [1] investigation of groundwater flows
- [2] stainless steel tank as experimental section to be filled with coarse sand
- [3] water supply via 2 open-seam tubes
- [4] water drain via 2 wells with open-seam tubes in the experimental section
- [5] water feeds and discharges can be adjusted separately via valves
- [6] 19 measuring connections with filters to detect the groundwater levels, arranged orthogonal to the tank bottom
- [7] 2 different models for excavation pits
- [8] 1 model for structure with waterproof bottom
- [9] groundwater levels displayed on the 19 tube manometers

### Technical data

#### Tank

- material: stainless steel
- content, LxWxH: 1000x615x350mm
- 19 measuring connections on the bottom of the tank

#### Plastic models

- excavation pit, LxWxH: 610x464x150mm
- excavation pit, LxWxH: 256x464x150mm
- structure with waterproof bottom
  - ▶ ØxH: 180x150mm, inner tube ØxH: 40x330mm

#### Measuring ranges

- pressure: 19x 0...300mmWC

LxWxH: 1340x900x1000mm

Weight: approx. 125kg

### Required for operation

water connection, drain  
sand (1...2mm grain size)

### Scope of delivery

- 1 trainer
- 3 models
- 1 set of hoses
- 1 set of instructional material