

# HM 286

## Experiments with a gear pump



### Description

- illustrative model of a gear pump
- closed oil circuit
- GUNT software for data acquisition, visualisation and operation
- part of the GUNT Labline fluid energy machines

Gear pumps belong to the group of positive displacement pumps with a continuous flow. Two counter-rotating gears transport the medium. The transported medium is between the housing and the tooth spaces. The pulsation-free flow increases linearly with speed. These pumps are particularly suitable for the generation of medium-high pressure at low flow rates.

The experimental unit provides the basic experiments to get to know the operating behaviour and the most important characteristic variables of gear pumps.

HM 286 features a closed circuit with a tank and a gear pump with variable speed via frequency converter. The pump gears are mounted in a transparent housing and can be observed during operation.

Flow rate and head are adjusted via a needle valve and an overflow valve. Oil is used as the medium.

The experimental unit is fitted with sensors for pressure and temperature. The oval wheel meter is especially used for the accurate flow measurement of viscous liquids. Oval wheel meters operate on the positive displacement principle with two precise oval gear wheels. The microprocessor-based measuring technique is well protected in the housing. The measured values are transmitted directly to a PC via USB where they can be analysed using the software included.

All the advantages of software-supported experiments with operation and evaluation are offered by the GUNT software and the microprocessor.

### Learning objectives/experiments

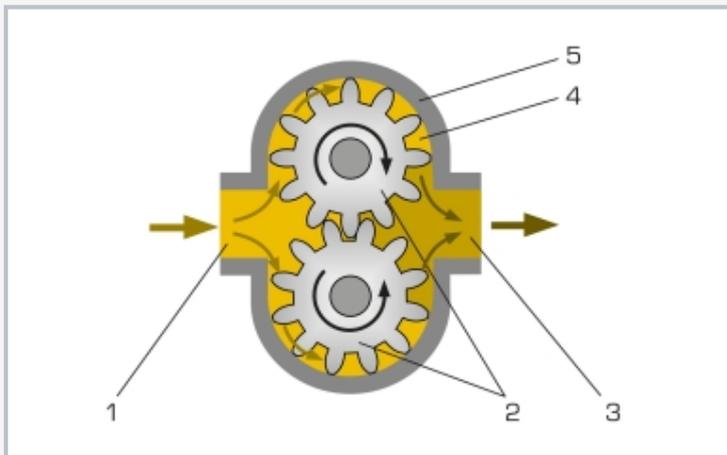
- principle of operation of a gear pump
- recording of pump characteristics
- relationship between head and speed
- effect of pressure limitation
- determination of efficiencies

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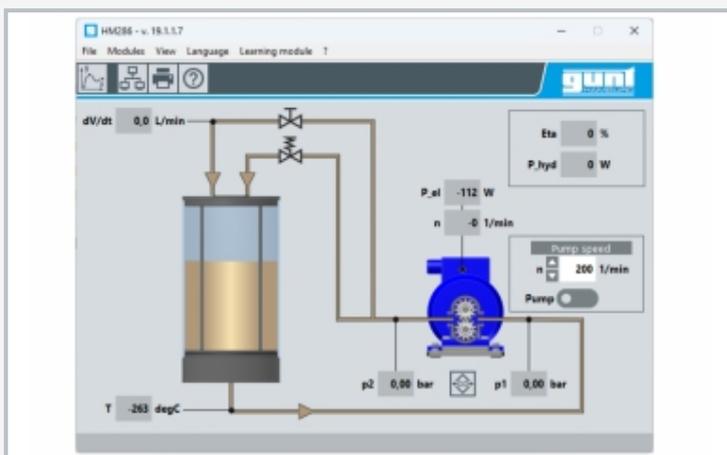
## Experiments with a gear pump



1 tank, 2 flow meter (oval wheel meter), 3 needle valve, 4 pressure sensor at outlet, 5 pressure sensor at inlet, 6 gear pump, 7 drive, 8 overflow valve for adjusting the head



Principle of operation of a gear pump  
1 oil inlet, 2 gears, 3 oil outlet, 4 tooth spaces as pumping chamber, 5 housing



Operating interface of the powerful software

### Specification

- [1] functioning and operating behaviour of a gear pump
- [2] closed oil circuit contains a gear pump with variable speed via frequency converter and a transparent tank
- [3] transparent housing for observing the pump gears
- [4] needle valve for adjusting the flow rate
- [5] overflow valve for adjusting the head
- [6] sensors for temperature and pressure at inlet and outlet of the pump
- [7] oval wheel meter as flow sensor
- [8] due to integrated microprocessor-based instrumentation no additional devices with error-prone wiring are required
- [9] display and evaluation of the measured values as well as operation of the unit via software
- [10] GUNT software with control functions and data acquisition via USB under Windows 10

### Technical data

Gear pump with speed-controlled drive

- power consumption: 370W
- nominal speed: 100...750min<sup>-1</sup>
- max. flow rate: 32cm<sup>3</sup> per revolution
- max. head: approx. 80m

Overflow valve: 0...5,5bar

Measuring ranges

- pressure (inlet): ±1 bar
- pressure (outlet): 0...5bar
- flow rate: 0...25L/min
- temperature: 0...100°C

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 670x590x750mm

Weight: approx. 50kg

### Required for operation

PC with Windows

### Scope of delivery

- 1 experimental unit
- 1 oil 5L (ISO VG 100)
- 1 GUNT software + USB cable
- 1 set of instructional material

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Optional accessories

WP 300.09

Laboratory trolley