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. All the advantages of software-supported experiments and evaluation are offered by the GUNT software and the microprocessor. The connection to a PC is made by USB.

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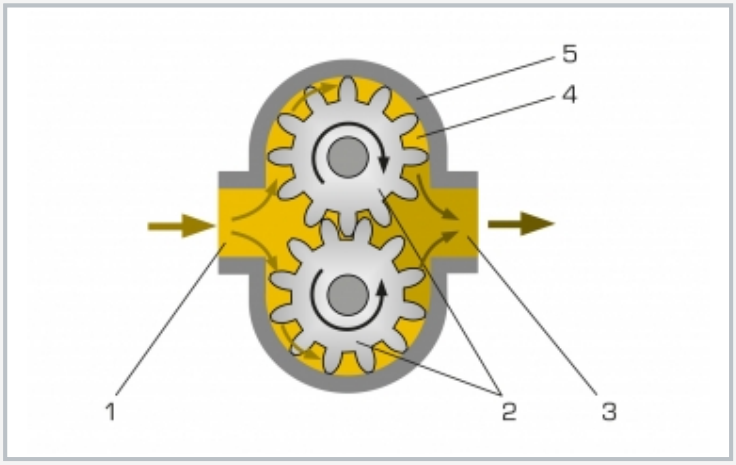
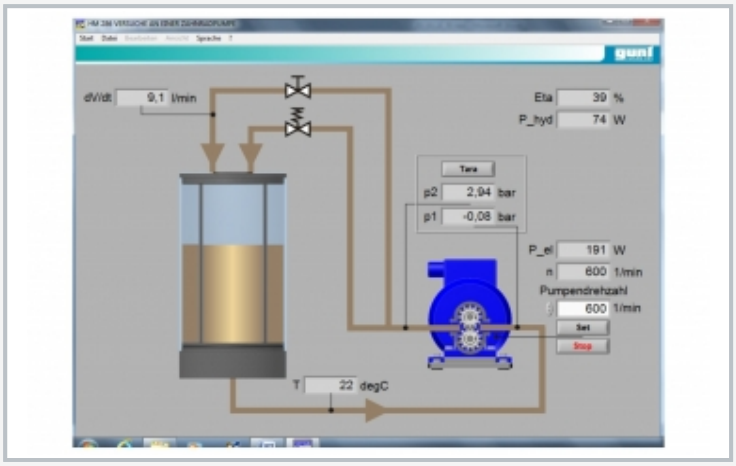
1 tank, 2 flow meter (oval wheel meter), 3 needle valve, 4 pressure sensor at outlet, 5 pressure sensor at inlet, 6 gear pump, 7 drive, 8 overflow valve for adjusting the head



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] microprocessor-based measuring technique
[9] GUNT software with control functions and data acquisition via USB under Windows 7, 8.1, 10

Technical data

Gear pump with speed-controlled drive
- power consumption: 370W
- nominal speed: 200...1000min^{-1}
- max. flow rate: approx. 15cm^3 per revolution
- max. head: approx. 100m

Overflow valve: 0...5,5bar

Measuring ranges
- pressure (inlet): ±1bar
- 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 CD + USB cable
1 set of instructional material

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Optional accessories

020.30009	WP 300.09	Laboratory trolley