

# CT 300.01

## Exhaust gas calorimeter for CT 300



The illustration shows a similar unit.

### Learning objectives/experiments

- determination of exhaust gas thermal output power given up
- determination of specific heat capacity of exhaust gas

### Description

- counterflow heat exchanger for calorimetric analysis of exhaust gases from internal combustion engines
- GUNT software for data acquisition for calorimetric test included in CT 300

Determination of the thermal exhaust gas losses is essential when calculating an energy balance for internal combustion engines. Calorimetric measurement is an established method of doing this. It involves a largely complete and loss-free heat exchange between the exhaust gas and a cooling medium.

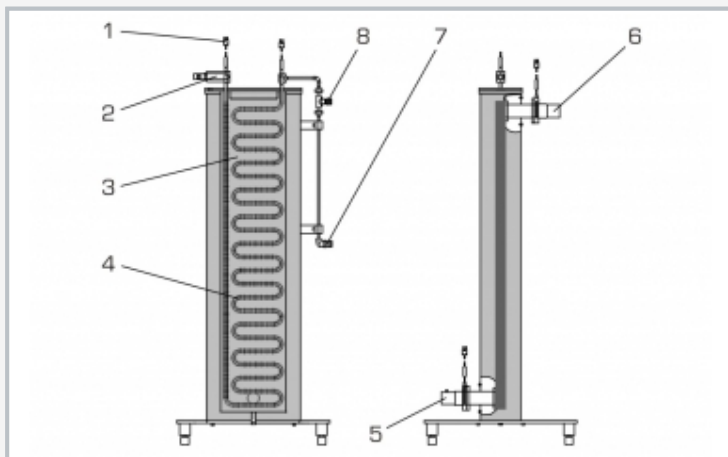
The exhaust gas calorimeter consists of an insulated stainless steel tank, through which the exhaust gas flows from bottom to top. While doing this, the exhaust gas gives up its heat almost completely to a finned pipe with cooling water flowing through it. The pipe is arranged in loops to achieve the maximum possible heat exchange area. Relevant temperatures (water and exhaust gas inlet and outlet) and the flow rate of the water are recorded electronically and displayed digitally using a measuring amplifier.

The measuring amplifier is connected to the CT 300 test stand using a data cable. This allows the measured data from the CT 300 to be stored and processed using software for data acquisition.

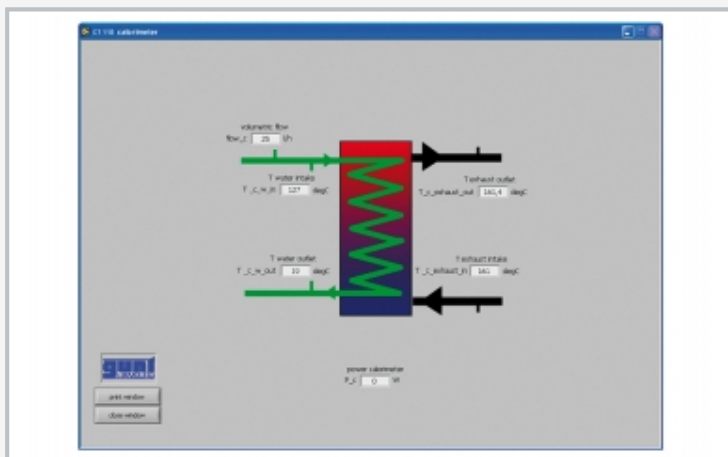
The CT 300.01 is connected to a test engine (CT 300.03 – CT 300.05) using a heat-resistant exhaust gas hose.

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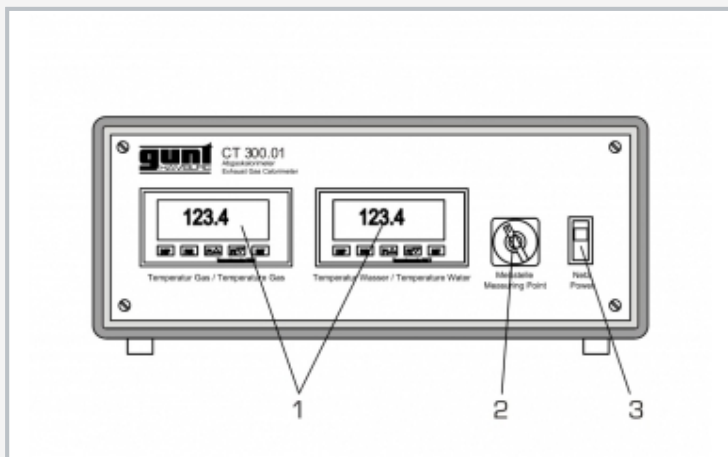
## Exhaust gas calorimeter for CT 300



1 temperature sensor, 2 water outlet, 3 chamber, 4 finned pipe, 5 exhaust gas inlet, 6 exhaust gas outlet, 7 water inlet, 8 manual valve for adjusting the cooling water flow rate



Software screenshot: process schematic



Measuring amplifier: 1 digital displays for exhaust gas and cooling water temperatures, 2 inlet / outlet reversing switch, 3 power switch

### Specification

- [1] determination of the amount of heat contained in the exhaust gas from test engines
- [2] calorimeter consisting of finned pipe heat exchanger and insulated tank
- [3] instrumentation: 4 temperature sensors, flow meter in CT 300
- [4] measuring amplifier with digital displays
- [5] connection between engine and calorimeter using exhaust gas hose
- [6] GUNT-software for calorimetric test included in CT 300 software
- [7] connection between measuring amplifier and CT 300 using data cable

### Technical data

#### Calorimeter

- insulated, stainless steel

#### Finned pipe heat exchanger

- heat exchange area on exhaust gas side: 1,169m<sup>2</sup>
- heat exchange area on water side: 0,164m<sup>2</sup>

#### Measuring ranges

- temperature:
  - ▶ 2x 0...600°C (exhaust gas)
  - ▶ 2x 0...200°C (cooling water)
- flow rate: 0...160L/h

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 570x570x1300mm (calorimeter)

LxWxH: 370x300x150mm (measuring amplifier)

Weight: approx. 105kg

### Required for operation

cold water connection 200L/h

drain

### Scope of delivery

- 1 calorimeter
- 1 measuring amplifier
- 1 exhaust gas hose
- 1 data cable for connection to CT 300
- 1 manual

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## Exhaust gas calorimeter for CT 300

Required accessories

063.30000	CT 300	Engine test stand, 11kW
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