

## CT 400.02 4-Cylinder Diesel Engine



- \* Engine for set-up of a test stand in conjunction with the CT 400 load unit
- \* Closed cooling water circuit
- \* Easy connection with CT 400 load unit

### Technical Description

In conjunction with the CT 400 load unit, the CT 400.02 test engine is a complete engine test stand. The engine used here is a four-cylinder diesel engine. It has its own closed cooling water circuit.

A solid welded frame on rollers, with a vibration-insulated base plate, carries the entire set-up. Hazardous areas such as hot surfaces and rotating parts are covered with perforated plates. The connection to the brake is made via a rotationally elastic coupling with a jointed shaft. The engine is attached to the load unit by fasteners.

The engine is fitted with sensors that measure the temperatures and the cooling water flow rate. The switch cabinet contains all of the electronic equipment for managing the engine (factory set). On the switch cabinet are an ignition key, an operating time counter and warning lamps. Data is transferred between the CT 400 load unit and the engine via a data cable connecting the switch cabinets for the two units. A starter battery is also housed in the frame.

For safety reasons, the engine has been modified in a way that it only starts when it is connected to the load unit both mechanically and electrically.

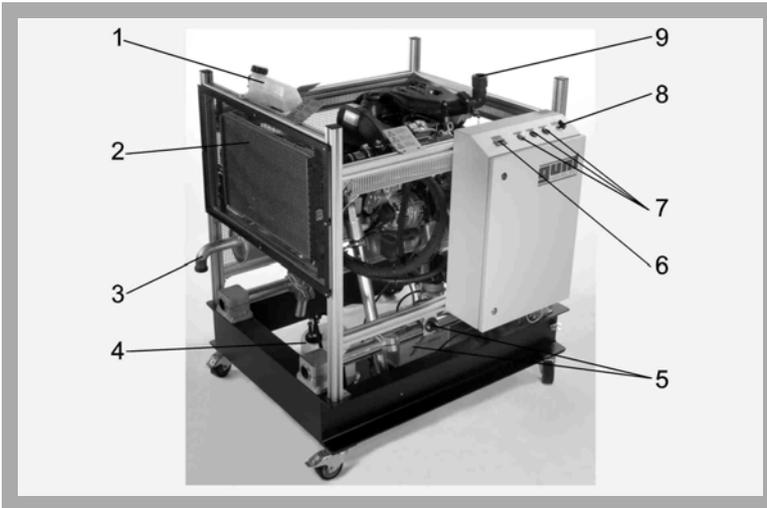
The well-structured instructional material sets out the fundamentals and provides a step-by-step guide through the experiments.

### Learning Objectives / Experiments

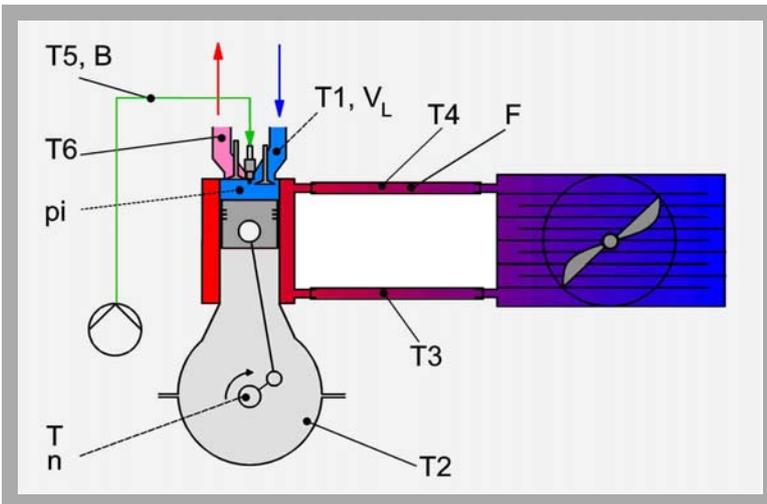
In conjunction with CT 400 load unit

- Plotting of torque and power curves
- Determination of specific fuel consumption
- Determination of volumetric efficiency and lambda (fuel-air ratio)
- Energy balances
- \* overall engine efficiency

## CT 400.02 4-Cylinder Diesel Engine



1 cooling water tank, 2 cooler with protective screen, 3 exhaust gas connection, 4 fuel tank, 5 battery with main switch, 6 operating time counter, 7 warning lamps, 8 key switch for ignition, 9 connection for engine feed air



Measuring points on the engine  
- temperatures: T2 oil, T3 engine cooling water inlet, T4 engine cooling water outlet, T5 fuel, T6 exhaust gas  
- F cooling water flow rate, B fuel consumption  
sensors in CT 400: T torque, n speed, T1 air temperature,  $V_L$  air quantity  
arrows: red - exhaust gas, blue - air, green - fuel  
In conjunction with CT 400.09 + CT 400.16: pi indicated pressure

### Specification

- [1] Water-cooled four-cylinder diesel engine for set-up an engine test stand in conjunction with CT 400 load unit
- [2] Engine flexibly mounted on mobile frame with vibration-insulated base plate
- [3] Power transmission to brake unit via elastic coupling and a jointed shaft
- [4] Engine complete with fuel supply (tank, pump, line) and cooling water circuit
- [5] Sensors for cooling water flow rate and temperatures (exhaust gas, cooling water, fuel, oil)
- [6] Transfer of measured data via data cable from switch cabinet to CT 400 control cabinet
- [7] Switch cabinet with warning lamps (oil pressure, alternator failure, preheat), operating time counter and ignition key

### Technical Data

- Water-cooled four-cylinder diesel engine
- displacement: 1968cm<sup>3</sup>
  - bore: 81mm
  - stroke: 95.5mm
  - power output: max. 47kW at 3000rpm
  - torque: max. 200Nm at 1750rpm
- Starter battery: 12V

Fuel tank capacity: 5L  
Engine oil: SAE 5W-30

### Dimensions and Weight

l x w x h: 1250 x 1150 x 1400 mm  
Weight: approx. 250 kg

### Connections

230V, 50/60Hz, 1 phase or 230V, 60Hz, 3 phase

### Scope of Delivery

- 1 engine, built into frame
- 1 set of instructional material

### Order Details

063.40002 CT 400.02 4-Cylinder Diesel Engine