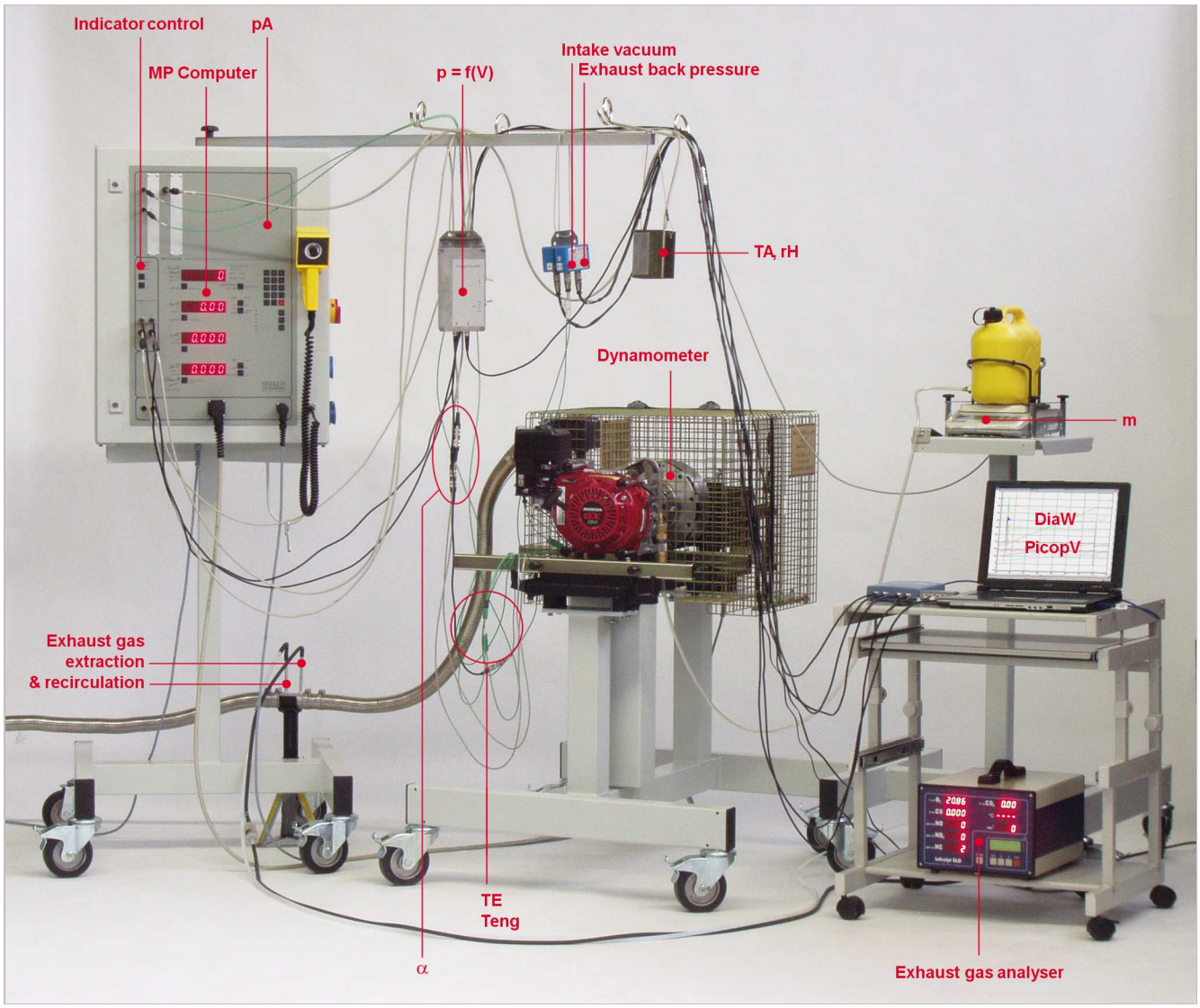
# p-V-diagram, fuel consumption metering and exhaust gas analysis

# Comparison of engines with different CR

**Demonstration equipment based on MPW 5 Modular engine dynamometer with MP Computer**




**p = f(V) = Cylinder pressure**
(Charge amplifier)

**α = Crank shaft position**

**m = Mass of fuel**

TA = Air Temperature
rH = relative Humidity
pA = Air pressure

**TE = Exhaust temperature**

**Teng = Cylinder head temperature**

DiaW = Diagram for Windows
PicopV = Software for determination of p-V-diagrams with DiaW

## Engine Modules


Single-cylinder spark ignition engines on module plates for fixation on a MPW 5 Modular engine test bed.

Both engines are equal except for their compression ratio (CR).
1. CR = 8.5 is the original value.
2. CR = 10 is a modification.

Both engines are equipped with special features for the following measurements:

**Fuel consumption metering:**

- Quick-connection coupling (**1**), which can be coupled to an external fuel tank on a balance.

**Exhaust gas analysis:**

- Flange (**2**) on the original exhaust gas silencer for fixation of a flexible metal hose which is equipped by one outlet and one inlet tube for exhaust gas extraction and recirculation.

**Pressures related to the engine's working cycle:**

- **Cylinder pressure:**
  - The original spark plug has been replaced by a measuring spark plug which is connected to the charge amplifier.
  - The crankshaft position is detected by a resolver disc (**3**) and two pick-ups.
- Sensors for the **absolute pressure** in the **inlet** duct after the throttle and in the **exhaust** gas flow (**4**).

**Temperatures:**

- Thermocouples under the spark plug (cylinder head temperature) and in the exhaust gas flow (**5**).

**Adjusting devices for**

- advance of ignition,
- air - fuel ratio (rich/lean mixture).

**Weinlich GmbH & Co. KG**
Industriestr. 6
D - 68799 Reilingen (near Heidelberg)
Germany

Phone 0 62 05 - 40 25
Fax 0 62 05 - 1 77 44
int'l 49 62 05 -

email info@weinlich.de
Internet http://www.weinlich.de