

Fuel Testing



Application note A011-ANP03-1216C



Testing and adjusting motorized outdoor power equipment is becoming more and more important due to strong environment regulations.

Traditional measurement of CO/CO₂ exhaust is extended by direct inline fuel flow measurement to accurately correlate fuel flow to unburned Hydrocarbons, CO and CO₂ and engine speed.

- ◆ Outdoor power equipment
- ◆ Blowers/Sprayers, Lawnmowers



Most equipment consists of a 2-stroke gasoline engine

Application requirements

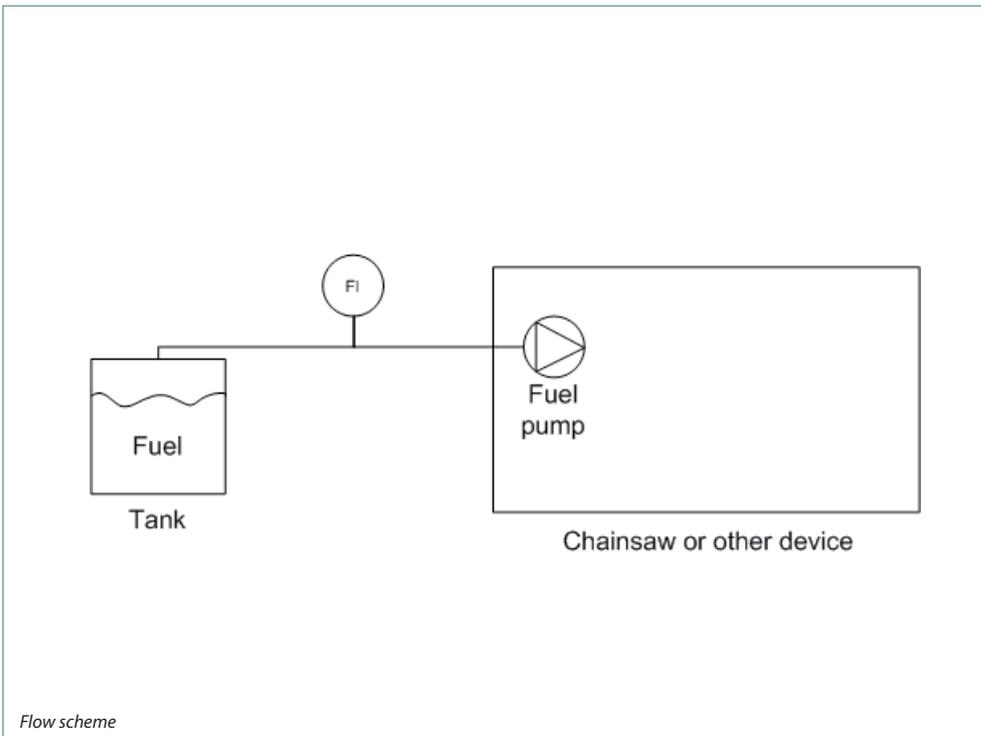
At testbenches in the production facilities there is a need for a highly accurate, fast responsive, reproducible and reliable in line fuel flow meter. Mass flow measurement has proven to be more accurate than volume flow measurement to meet environment regulations. Each test location needs to have

the flexibility to test engines with very different horsepower (and therefore fuel flowrates) with different hook-up points. Ranges from 30 g/h...3 kg/h are typical for these devices.

Important topics

- ◆ High fuel efficiency
- ◆ Improve drivability and durability
- ◆ Comply to emission legislation

Process solution



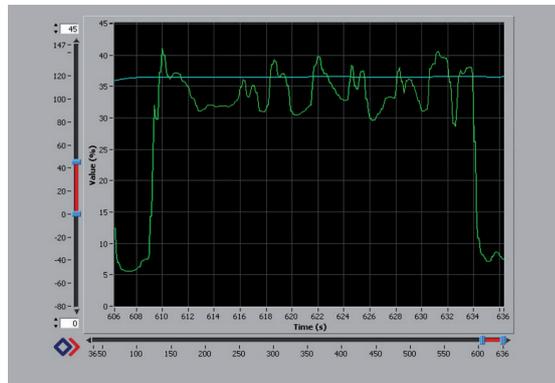
Flow scheme

Testing and adjusting motorized power equipment.

This is a highly interesting application for mini CORI-FLOWS. Several instruments of type M14 are already in use in the field to accurately adjust the 2-stroke engines for all kinds of power tools for outdoor use. Traditional methods using only CO/CO₂ concentration measurement at the engine exhaust are extended with fuel flow meters between the fuel tank and the engine. With atmospheric inlet pressure the fuel pump will suck the fuel through the flow meter into the engine. An exact fuel flow measurement with an accuracy of up to 0.2% reading ± zero stability can be guaranteed. An M14 mini CORI-FLOW instrument can measure fuel flows from 30 g/h...30 kg/h. The actual needed flow rate will depend on the type of engine. E.g. Chainsaws will use flow rates up to 1 kg/h. Weed eaters up to 0.5 kg/h. Where mini CORI-FLOW instruments are multi-variable flowmeters, also density and temperature measurement will be available at the same time. In fact everywhere where fuel powered engines are used, this type of applications can be found.

The hardest parameter to predict are unburned Hydrocarbons, but with accurate fuel flow this is easy. ▶

The testing is for two reasons, both of which are important. 1. Emissions, 2. Quality. Using previously collected data, it is possible to accurately correlate fuel flow to unburned Hydrocarbons, CO and CO2 and engine speed.



Chain saw fuel flow measurement with mini CORI-FLOW M14

Recommended Products



mini CORI-FLOW M14
mini CORI-FLOW M14 Coriolis flowmeter for ranges of 30 g/h...30 kg/h and additional density and temperature output; analog signals and RS232 are standard; fieldbus communication is optional (e.g. Profibus-DP, Modbus, DeviceNet, Flow-Bus).

- ◆ Accuracy: 0.2% reading +/- zero stability
- ◆ SS316L wetted parts, all metal
- ◆ No moving parts
- ◆ Temperature: 0...70 °C
- ◆ Alarm and totalizer facilities
- ◆ Fast response (up to 50 msec.)
- ◆ Easily re-rangeable for different flow rates
- ◆ Power: +15..24Vdc ; pressure: up to 200 bara
- ◆ IP65



CORI-FLOW M54
CORI-FLOW M54 Coriolis flowmeter for ranges of 200 g/h ... 100 kg/h.

- ◆ Accuracy: 0.2% reading +/- zero stability
- ◆ SS316L wetted parts, all metal
- ◆ No moving parts
- ◆ Temperature: 0...70 °C (or higher)
- ◆ Alarm and totalizer facilities
- ◆ Fast response (up to 100 msec.)
- ◆ Easily re-rangeable for different flow rates
- ◆ Power: +15..24Vdc ; pressure: up to 100 bara
- ◆ IP65

Contact information



T +31(0)573 45 88 00 F +31(0)573 45 88 08
I www.bronkhorst.com E info@bronkhorst.com

Fuel testing
A011-AN03-1216D

ANP: Analytical Process/Industry
03: Elemental Analysis

