Application example

ONO SOKKI

Response comparison between Exhaust gas analyzer and Massflow measurement system

Measurement items :instantaneous flow rate, temperature, pressure (density, massflow)
Application :evaluation for various engines of automobile, farm machine, construction machine

Purpose

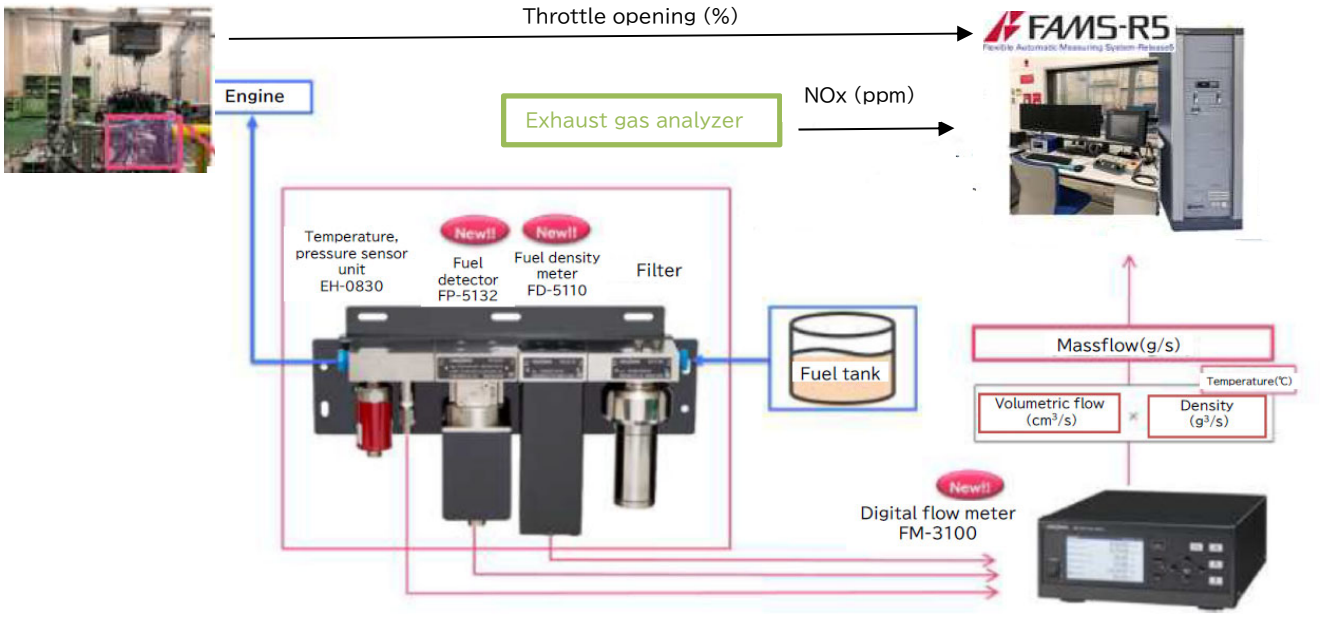
The method to calculate the fuel flow rate from the measured value of the exhaust gas analyzer cannot respond to changes of instantaneous flow during transitional operation at high speed. In this experiment, we will compare the responsiveness of the massflow measurement system and the exhaust gas analyzer during transitional operation.

Overview

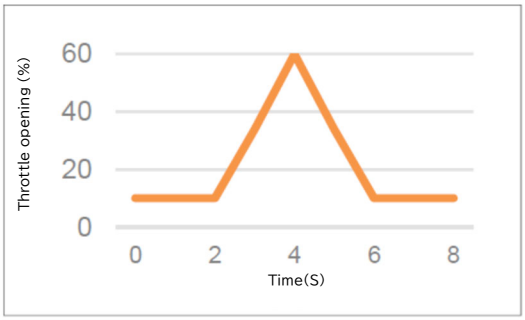
The throttle opening of engine is transiently controlled.
Compare the delay time of measurement result between the massflow measurement system and the exhaust gas analyzer.

	Flow detector	Density meter	Flow meter
① Massflow system	FP-5132	FD-5110	FM-3100
② Exhaust gas analyzer (made by other manufacture)			

Measurement system



Control method
- Triangle pattern (right)
- Throttle opening 10→ 60→ 10 (%)
- Engine rotation speed (constant) 3000 r/min



Measurement result

Comparison of responses when engine starts

As the graph shown, there were delays in each measurement result with respect to the change in throttle opening.

Compared to the exhaust gas analyzer, the mass flow measurement system has much less delay with respect to throttle changes and responds at high speed.

FP-5132(2400 P/R)+FM-3100(1 ms)
→Ideal for massflow rate measurement in transient test pattern