

TruckFlow

Gas mass flow sensors for:

- Automotive
- Construction and Agriculture
- Stationary engines
- Future technologies



Flow measurement on the engine

Gas mass flow measurement on combustion engines - A Must

Global emissions regulations are tightening – with Euro 6/7, China 6/7, and Bharat 7 already in view. For both passenger cars and commercial vehicles, precision is no longer optional. Accurate air and EGR flow measurement is essential – for compliance, and for performance as well.

Our gas mass flowmeters deliver reliable results at every critical measurement point, tailored to all types of engine architectures and control strategies:

1. Air upstream of the turbocharger

Calibration of the flow measurement depends heavily on the piping at the inlet. This location is ideal if airflow variants are limited or homogenized, for example by neutralising flow elements.

2. Air before the intercooler

Top spot for precise results: The intercooler dampens pulsations, and turbocharger dynamics help expand the measurable range.

3. Air after intercooler

Challenging due to strong pulsations – but cooler temperatures allow compact, flange-mounted sensors that save space and installation effort.

4./5. Hot and cold EGR

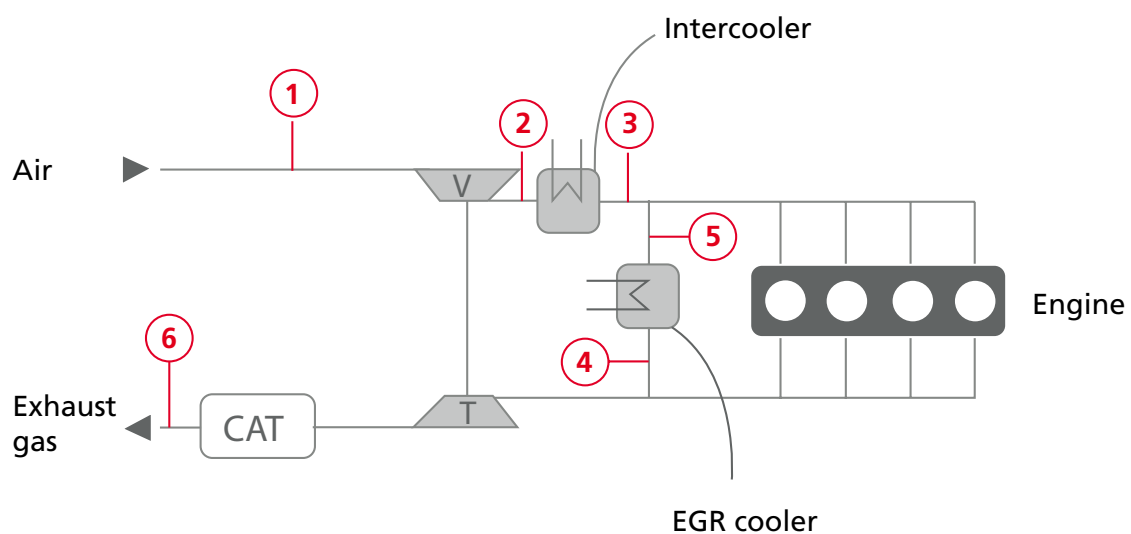
Condensates and particles at this location often lead to reduced accuracy and increased pressure loss. Modern coatings increase the media compatibility of the sensors and reduce particle adhesion to the primary element.

6. Exhaust gas volume measurement

Often used, for example, to control the AdBlue injection at the SCR catalytic converter. However, high temperatures can be an issue. Measuring after the particle filter helps keeping the primary element clean.

7. Other measuring points

Further measuring points can be found when using natural gas, biogas, air in multi-stage turbocharging or on the oxygen side of fuel cells.



Mass flow rates at the engine

Challenges on the engine

Precision made easy with TruckFlow – and differential pressure measurement

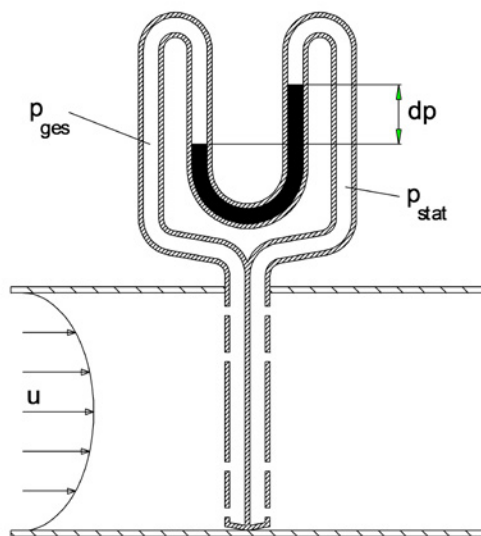
Gas mass flow measurement on the engine is complex, but solvable – with TruckFlow from systec Automotive. Our system uses the proven differential pressure principle, tailored through in-house R&D to meet the dynamic demands of engine applications.

The result: precise, reliable measurements across the entire vehicle lifespan.

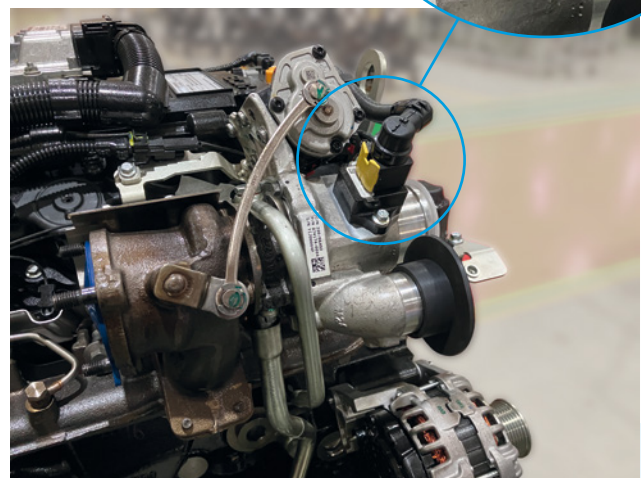
TruckFlow delivers high accuracy with minimal pressure loss, supporting both efficiency and performance.

The measurement system consists of three core components:

- A primary element (e.g. Venturi, nozzle or orifice)
- Sensors
- The evaluation unit



The differential pressure measurement principle



TFI mounted on the engine

TruckFlow

TruckFlow – Reliable gas mass flow measurement on the engine

Engine-ready by design: With TruckFlow, systec Automotive has engineered all three components of differential pressure measurement specifically for engine applications – ensuring maximum precision and minimum system impact.

Digital evaluation in real time

Our TFI platform delivers fully digital signal processing with ultra-fast sampling and intelligent filtering – no mapping required. The result: precise, stable readings at all times.

Autonomous and ECU-independent

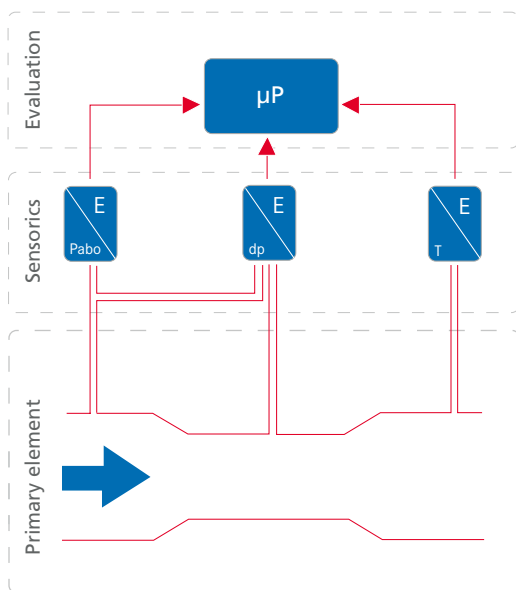
TruckFlow measures temperature, pressure, and differential pressure autonomously and calculates the mass flow in real time – without loading the ECU. Fast, lean, and integration-friendly.

Optimized primary element

We support you from concept to series production: CFD simulation, inlet condition analysis, pressure loss optimization, packaging, special designs, and prototyping – all from a single source.

Robust, high-performance sensors

Our sensors are 10 to 100 times more stable and accurate than many standard solutions. They capture engine-side pulsations and actively correct their influence – ensuring precise flow measurement regardless of mounting position.



**TruckFlow – Simply precise.
For the entire vehicle lifetime.**

Structure of the sensor platform

TFI sensor platform

Precision in the smallest space: TFI from systec Automotive

TFI is fully optimized for automotive use – compact, powerful, and uniquely precise. Its ultra-fast, finely calibrated sensors deliver top-tier measurement accuracy directly on the engine.

With sampling rates exceeding 2 kHz, TFI reliably separates pressure pulsations from true flow fluctuations – enabling production-level precision previously only found on engine test benches.

As a CAN sensor, TFI not only provides a high-quality flow signal but also delivers real-time pressure, temperature, and full OBD diagnostics – eliminating the need for multiple sensors. Durable advanced coatings protect the sensor from chemical wear.

Flexible sensor formats, one platform:

- Flange sensor for Venturi and nozzle setups
- Hose version for high-temperature use
- Inline probe for dynamic pressure measurement

TFI – Engine-ready accuracy. Compact. Reliable. Smart.

WHAT MAKES TFI SO UNIQUE:

The patented integration of the three measurement variables p , dp and T in a compact, cost-effective measuring unit/sensor. Thus, TFI filters, calculates and analyses the signal autonomously and adaptively.



systec Automotive

Gas mass measurement on the combustion engine with systec Automotive:

- Precise over the entire measuring range
- Insensitive to pulsation
- Long-term stability up to 1,600,000 km or 25,000 hours
- Low pressure loss
- Low drift
- Insensitive to contamination
- Suitable for high temperatures and pressures

About systec Automotive:

systec Automotive develops and produces measurement technology for use in passenger cars and commercial vehicles. Our claim: Technologically leading solutions for the best possible benefit of our customers. From EGR measurement technology to CAN temperature sensors and measurement solutions for the test bench, we find the right solution for every measurement task on the engine.

From our headquarters in Puchheim near Munich, we supply our solutions to customers all over the world, from Germany to the USA, India, China and Australia.

More products from systec Automotive



Exhaust gas measurement on the engine test bench

Precise reference air mass measurement is one of the most important parameters for exhaust gas optimisation of modern engines. It is also one of the most difficult measurement tasks, as it has to fulfil a number of very specific requirements.



Oxygen measurement on fuel cells

We support fuel cell manufacturers and users from development through to volume production for both mobile and stationary hydrogen applications, with a focus on the air/oxygen side of fuel cells (fuel stacks).



PEMS: Mobile gas mass measurement on cars and commercial vehicles

The demand for reliable gas mass measurement for portable emission measurement systems (PEMS) has been increasing. We meet the demand.



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