

NEW

**FLWSIC
150**



Product Information

FLWSIC 150 Carflow
**Ultrasonic Measurement System
for Measuring Exhaust Gas Volume
Flow Rate in Automotive Industry**

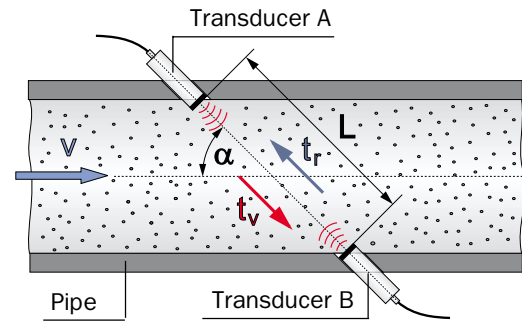
SICK | MAIHAK

Operating principle

The transit time of an ultrasonic pulse between two transducers is measured on 1 or 3 measuring paths. The transducers of an individual path are mounted at both sides of a pipe at a certain angle to the gas flow. Each transducer operates intermittently as a transmitter and a receiver. The gas velocity will affect the transit time of a pulse travelling along a path between two transducers. In the forward direction, the transit time (t_v) is shorter than that in the opposite direction (t_r).

The difference between the transit times is used to measure the gas velocity in the path.

Using the 3-path configuration, the measurement is largely independent of the flow profile and installation conditions.



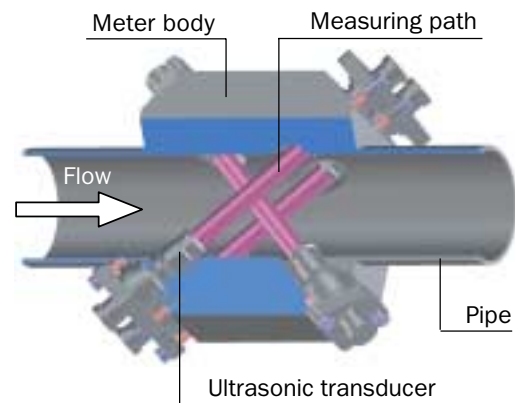
$$v = \frac{L}{2 \cdot \cos \alpha} \cdot \left(\frac{1}{t_v} - \frac{1}{t_r} \right) \quad Q_{act.} = \frac{v \cdot A}{1000}$$

v = Gas velocity [m/s]
 L = Path length [m]
 α = Measuring angle [°]
 $Q_{act.}$ = Actual volumetric flow rate [l/s]
 A = Internal pipe cross-sectional area [m²]

Features

- Ultrasonic measurement
 - ➔ Direct measurement of exhaust gas volume flow
- 1 or 3 measuring paths
 - ➔ Maximum accuracy - also at lowest gas velocities
- Compact design, mobile system
 - ➔ "Plug and play"
- Measurement of undiluted raw exhaust gas
 - ➔ Simultaneous gas analysis at lowest concentrations possible
- Specially adapted to the requirements of roll test stands and road test simulators
 - ➔ Quick-release connectors (standard 2 1/2")
 - ➔ Integrated heating unit prevents gas condensation

3-path configuration



Advantages

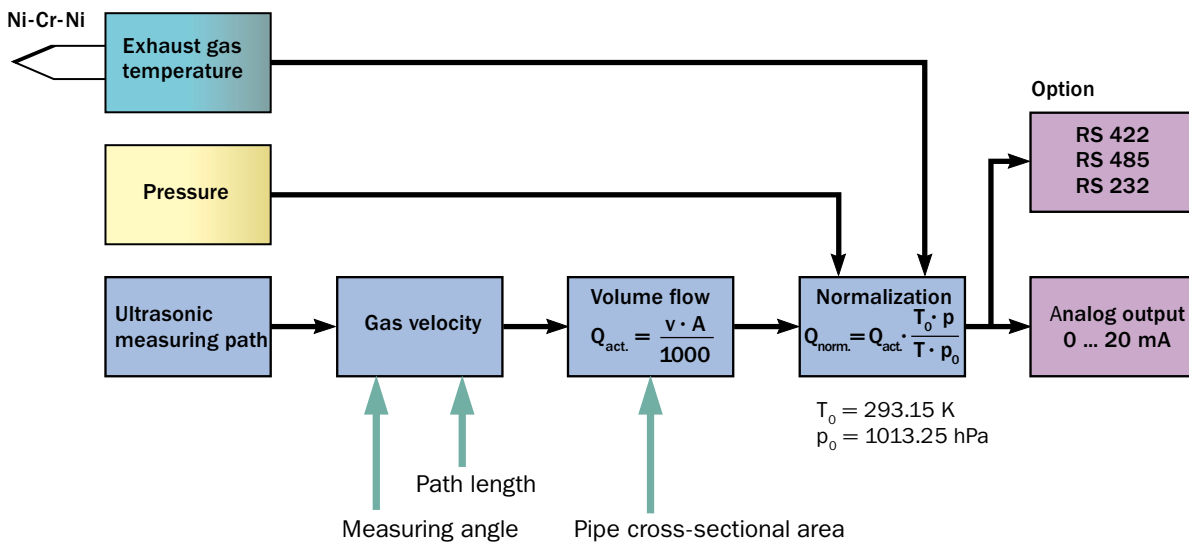
- No moving parts, no wear-and-tear
- Fast response („real time“ flow measurement), engine components and electronics can be optimized
- Practically no loss of pressure, no influence on engine characteristics
- Low maintenance expenditure

Fields of Application

- Roll test stands in automotive industry
- Test stands for Diesel and Gasoline engines

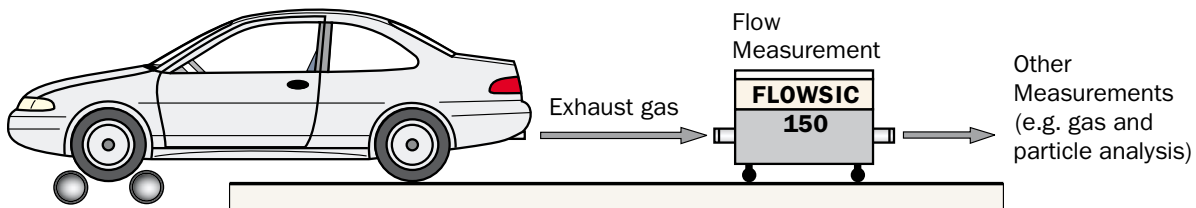


Signal processing flow diagram



The FLOWSIC 150 Carflow delivers normalized flow rates based on ultrasonic flow and internal temperature and pressure measurement.

Application example roll test stand



Technical Data

System data	
Measuring value	Gas velocity, volume flow (actual), volume flow (normalized), speed of sound, gas temperature, absolute pressure
Measuring range volume flow (normalized) *	Q_{min} : 1.0 l/s (1 path); 0.3 l/s (3 paths) Q_{max} : 150 l/s
Pulse rate	1x 75/s (1 path) 3x 25/s (3 paths)
Typ. accuracy	< $\pm 2.5\%$ of measured value, from $0.1 Q_{max}$ to Q_{max} (1 path) < $\pm 0.7\%$ of measured value, from $0.05 Q_{max}$ to Q_{max} (3 paths)
Gas velocity	0 ... 40 m/s
Max. Gas temperature (< 10 min per 1 h)	250 °C
Max. Transducer temperature	220 °C
Pressure	660 ... 1100 hPa
Operating voltage	90 ... 140 V AC; 50/60Hz or 190 ... 260V AC; 50/60Hz, selectable
Power consumption	approx. 620 W
Outputs	
Analog output	0/2/4 ... 20 mA, max. load 760 Ohm; up date rate 25/s,
RS 232	programmable update rate, for parametrization via PC
Dimensions	
Connection thread	G 2 1/2" (other on request)
Nominal length	700 mm
Mass	approx. 80 kg

*: for internal pipe diameter 70 mm; other pipe dimensions/higher flow rates on request

The dialogue continues.

Copy, complete and fax to +49 7641 469 1149

Company	
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Industry/Field of Application	

Yes, I would like to know more about the field of:

- | | |
|--|---|
| <input type="checkbox"/> In-process gas analysis | <input type="checkbox"/> I would like a detailed consultation with one of your project advisors. Please arrange a meeting for me. |
| <input type="checkbox"/> Flue gas monitoring | |
| <input type="checkbox"/> Emission monitoring | |
| <input type="checkbox"/> Dust measurement | |
| <input type="checkbox"/> Volume flow measurement | |
| <input type="checkbox"/> Data acquisition and evaluation | |
| <input type="checkbox"/> Water analysis | |
| <input type="checkbox"/> Liquid analysis | |
| <input type="checkbox"/> Level measurement | |
| <input type="checkbox"/> Tunnel sensors | |
| <input type="checkbox"/> Special measurement technology | |

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