

FLAWSIC Volume Flow and Gas Flow Measuring Devices

Natural Gas Metering
Process Applications
Emission Monitoring

Ultrasonic technology by SICK MAIHAK: Measurements of gas flow rates at the highest level

Apart from measurement of temperature and pressure, there is also a great demand in industry for solutions for measurement of volume flow in air and exhaust gas ducts as well as in pipelines. SICK MAIHAK offers a great range of measuring devices for these applications. By manufacturing a wide variety of ultrasonic transducers and devices in-house, SICK MAIHAK is able to meet most industrial specifications. Specifically challenging requests are “cracked” by specific solutions.

NATURAL GAS APPLICATIONS

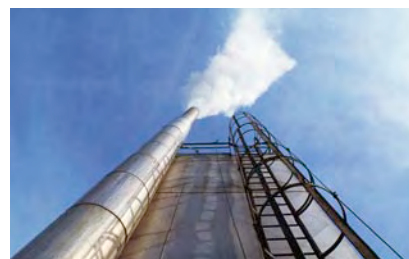
The natural gas market is divided in four segments: production, transport, storage and distribution. In each of these segments the quantity of natural gas flowing through the pipelines must be metered. The FLOWSIC600 is suitable for all applications in all four segments, thanks to the great versatility of the materials, the measurement accuracy and the temperature and pressure resilience. Be it as a measuring device in the process chain, or as an adjustable gas meter for billing of natural gas in the customer end business.

PROCESS APPLICATIONS

Very important in the process instrumentation is the availability of flow measurement values online that also meet the high accuracy level required for continuous transfer control. With its variation of construction the FLOWSIC100 line and the FLOWSIC600 can be used for almost all measuring tasks. We consolidate requirement with budget: measurement accuracy, temperature and pressure range. SICK MAIHAK offers the right solution.

EMISSION MONITORING

Environmental protection and combating climate change – these topics are two of the greatest global challenges for politics and the economy. That is why the implementation of the German Federal Immission protection law (BImSchG) receives much attention. The FLOWSIC100 line contributes significantly to the realization of the continuous measurement of the exhaust gas flow rate in e.g. power and cement plants. This highly accurate measuring data forms the basis for quantifying pollutants and is a technological base to implement the global emission trading scheme.



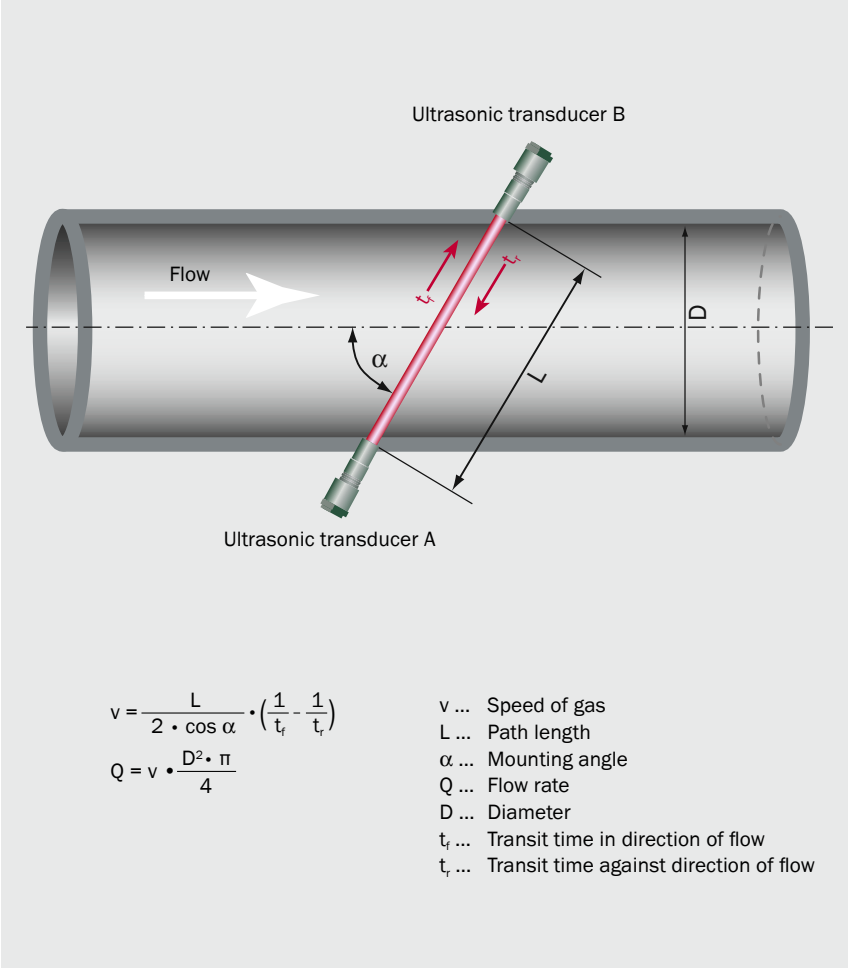


ULTRASONIC MEASURING PRINCIPLE

Two ultrasonic transducers, mounted at a certain angle to the flow axis function alternately as sender and as receiver. That means, that they each send and receive alternately ultrasonic pulses which are either accelerated or slowed down depending on their travel direction, with ("forward direction" t_f) or against ("reverse direction" t_r) the gas flow. The resulting difference in transit times is used to determine the mean gas velocity. The cross-sectional area yields the volumetric flow during operation.

Advantages:

- The measuring result is independent of pressure, temperature and gas composition
- No moving parts means low maintenance
- No interference on flow, minimal loss of pressure.



Continuous emission monitoring

FLAWSIC100



FEATURES	FLAWSIC100 H HIGH POWER	FLAWSIC100 M MEDIUM POWER	FLAWSIC100 S SMALL SIZE	FLAWSIC100 PR PROBE TYPE
Version	<ul style="list-style-type: none"> Standard: unpurged Internal cooling (AC) 	<ul style="list-style-type: none"> Standard: unpurged Internal cooling (AC) 	<ul style="list-style-type: none"> Standard: unpurged 	<ul style="list-style-type: none"> Standard: unpurged Internal cooling (AC)
Configuration	1-path measurement, 2-path measurement			
Application	<ul style="list-style-type: none"> High power version for large stack diameters up to 13 m Suitable for high dust application 	<ul style="list-style-type: none"> Medium power version – best suitable for stack diameters up to 3.4 m 	<ul style="list-style-type: none"> Special small size transducers optimized for small stack diameters of 0.15 up to 1.7 m 	<ul style="list-style-type: none"> For stack diameters greater than 0.4 m Probe type with two transducers for the installation from one side only
Product features	<ul style="list-style-type: none"> Rugged titanium transducers for higher device durability Corrosion resistant probe materials Innovative internal cooling (“AC” types) Integral measurement over the entire stack diameter 		<ul style="list-style-type: none"> Rugged titanium transducers for higher device durability Corrosion resistant probe materials Integral measurement over the entire stack diameter 	<ul style="list-style-type: none"> Rugged titanium transducers for higher device durability Corrosion resistant probe materials Innovative internal cooling (“AC” types)
Customer benefits	<ul style="list-style-type: none"> Use in aggressive gases Very low maintenance requirements and low operation costs For gas temperatures up to 260 °C (standard); with internal cooling up to 450 °C No purge air 		<ul style="list-style-type: none"> Use in aggressive gases Very low maintenance and low operation costs For gas temperatures up to 150 °C No purge air 	<ul style="list-style-type: none"> Very low maintenance and low operation costs For gas temperatures up to 260 °C (standard); with internal cooling up to 350 °C No purge air
Conformities	2001/80/EC, 2000/76/EC, 27 th BImSchV ¹⁾ , Air Quality Control (TA Luft)		–	2001/80/EC, 2000/76/EC, 27 th BImSchV ¹⁾ , TA Luft
Maintenance	<ul style="list-style-type: none"> Very low maintenance thanks to no moving parts, corrosion resistant probe materials and no purge air is used 			
System components	<ul style="list-style-type: none"> Sender/receiver units MCU control unit Connection box Connection cables Flanges with tube 			<ul style="list-style-type: none"> Sender/receiver unit with measuring probe MCU control unit Connection cables Flanges with tube
General	Fully automatic zero and span check			

¹⁾ Federal Immission Control Ordinance

Gas flow measurement for process applications



FLOWSIC100 PROCESS CL150/PN16	FLOWSIC100 PROCESS EX-Z2/EX-Z2-RE	FLOWSIC100 PROCESS PR-EX-Z2
<ul style="list-style-type: none"> • Pressure version 	<ul style="list-style-type: none"> • Ex-protected version • Retractable 	<ul style="list-style-type: none"> • Ex-protected probe version
1-path measurement, 2-path measurement		
<ul style="list-style-type: none"> • Ambient pressure up to 16 barg • Material: hermetically sealed stainless steel or titanium 	<ul style="list-style-type: none"> • Ambient pressure up to 16 barg • Material: hermetically sealed stainless steel or titanium • Ex-protected version for use in hazardous area zone 2 	<ul style="list-style-type: none"> • Ambient pressure up to 16 barg • Material: hermetically sealed stainless steel and titanium • Ex-protected version for use in hazardous area zone 2 • Installation from one side only
<ul style="list-style-type: none"> • Rugged titanium transducers for higher device durability • Corrosion resistant probe materials • Integral measurement over the entire stack diameter • Contact-free measurement • High measuring accuracy even at gas velocity near zero 		<ul style="list-style-type: none"> • Rugged titanium transducers for higher device durability • Corrosion resistant probe materials • Contact-free measurement • High measuring accuracy even at gas velocity near zero
<ul style="list-style-type: none"> • Use in aggressive gases also possible • Representative measuring results • Independent of pressure, temperature and gas composition • No purge air 		
-	II 3 G EEx nA e IIC T4 according to ATEX guideline 94/9/EC ²⁾ (manufacturer licence)	II 3 G EEx nA e IIC T4 according to ATEX guideline 94/9/EC (manufacturer licence)
<ul style="list-style-type: none"> • Very low maintenance thanks to no moving parts, corrosion resistant probe materials and hermetically sealed transducer design 		
<ul style="list-style-type: none"> • Sender/receiver units • MCU control unit, optional 24 V DC type and ex-protected version for zone 2 • Connection box (FLOWSIC100 CL150/PN16 only) • Connection cables • Flanges with tube 		
Fully automatic zero and span check		

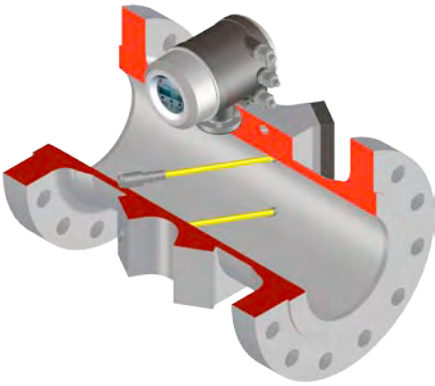
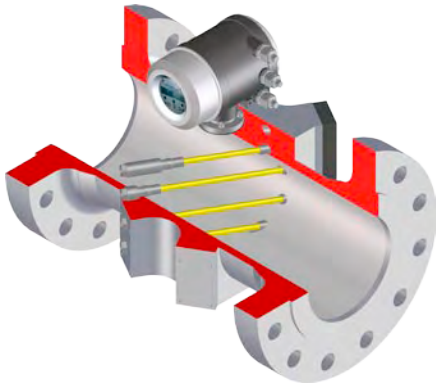
²⁾ Zone 1 on request

Gas flow meters for process and custody applications

FLWSIC600



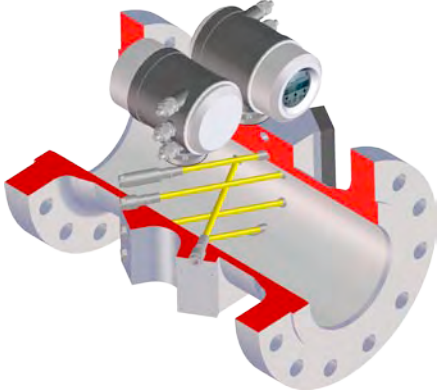
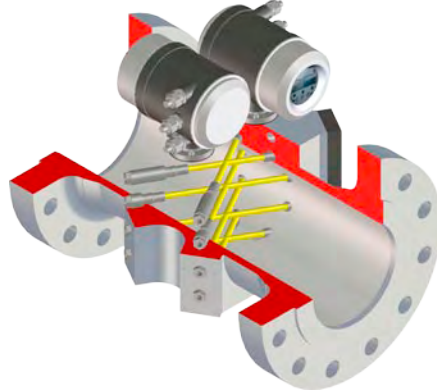
☆☆ FLOW SIC600 2-path
 ☆☆☆ FLOW SIC600 4-path

FEATURES	FLWSIC600 2-PATH	FLWSIC600 4-PATH
Version	 <p>2" ... 48" Process</p>	 <p>3" ... 48" Fiscal</p>
Measuring task	An ultrasonic gas flow meter for process and technological measurements. Applicable for non-custody metering where uncertainties of up to $\pm 1\%$ are requested.	A custody approved ultrasonic gas flow meter for fiscal metering with: <ul style="list-style-type: none"> • an uncertainty of $\pm 0.5\%$ • an uncertainty of $\pm 0.2\%$ after calibration at a flow test facility
Application	<ul style="list-style-type: none"> • Gas processing and consumptive industries • Chemical and petrochemical industries • All sections of the natural gas industry, such as gas production, transport, distribution and storage • Natural gas and process gases such as N_2, O_2, H_2, Cl_2, sour or bio gases 	
Product characteristics	<ul style="list-style-type: none"> • Non-intrusive measurement • Uni or bidirectional measurement • Overload safe • No mechanical wear • Large measuring range (max. 1 : 130) 	
Approvals	ATEX, CSA, PED	ATEX, CSA, PED, OIML, AGA, API, PTB, NMI, GOST, ...
Maintenance	No periodical maintenance	
System components	<ul style="list-style-type: none"> • Meter body • Signal processing unit • Ultrasonic transducers 	

Gas flow meters for custody applications



- ★★★★★ | ★ FLOWSIC600 2plex
- ★★★★★ | ★★★★★ FLOWSIC600 Quatro

FLOWSIC600 2plex	FLOWSIC600 Quatro
 <p>3" ... 48" Fiscal</p>	 <p>3" ... 48" Fiscal</p>
<p>A custody approved ultrasonic gas flow meter together with a check flow meter in one meter body. The FLOWSIC600 2plex detects piping caused error influences (piping and flow plate contamination) before they affect the fiscal metering.</p> <p>Fiscal metering with:</p> <ul style="list-style-type: none"> • an uncertainty of $\pm 0.5\%$ or • an uncertainty of $\pm 0.2\%$ after calibration at the flow test facility 	<p>Two custody approved ultrasonic gas flow meters within one meter body for redundant fiscal metering each with:</p> <ul style="list-style-type: none"> • an uncertainty of $\pm 0.5\%$ or • an uncertainty of $\pm 0.2\%$ after calibration at the flow test facility
<ul style="list-style-type: none"> • Gas processing and consumptive industries • Chemical and petrochemical industry • All sections of the natural gas industry, such as gas production, transport, distribution and storage • Natural gas and process gases such as N₂, O₂, H₂, Cl₂, sour or bio gases 	<ul style="list-style-type: none"> • Gas processing and consumptive industries • Chemical and petrochemical industries • All sections of the natural gas industry, such as gas production, transport, distribution and storage • Natural gas and process gases such as N₂, O₂, H₂, Cl₂, sour or bio gases • As 8-path version applicable at flow test facilities
<ul style="list-style-type: none"> • Non-intrusive measurement • Uni and bidirectional measurement • Overload safe • No mechanical wear • Large measuring range (max. 1 : 130) 	
<p>ATEX, CSA, PED, OIML, AGA, API, PTB, NMI, GOST, ...</p>	
<p>No periodical maintenance</p>	
<ul style="list-style-type: none"> • Meter body • Signal processing unit • Ultrasonic transducers 	

AT HOME IN THE INDUSTRIAL SECTOR

We can build on years of experience in the field of Analyzers and Process Instrumentation. That is why we are at home in the natural gas industry (production, transport, storage and distribution) as well as in the chemical or petrochemical industry. Be it custody measurements or simple monitoring tasks – we offer tailor-made solutions.



WE OFFER YOU A CHOICE

SICK MAIHAK offers a number of sensor-based techniques for analysis, ranging from the continuous gas and dust measurement to specialized applications for water and liquid analysis. Within the process measurement technology our products play a central role in determining volume flow of gases and level of bulk materials.



AROUND THE WORLD TO YOUR SERVICE

Wherever you are, our global network of subsidiaries and representatives is able to supply qualified support when you need it. We deliver the equipment for your measuring tasks, provide documentation and training. Our highly skilled service staff offers support during installation, commissioning and maintenance of the appliances.



SICK GROUP

SICK MAIHAK represents the process automation segment of the SICK group, one of the worlds leading manufacturer of intelligent sensors and sensor solutions. With its 4,300 employees, SICK offers an extensive portfolio of products and services on the market of factory and process automation. www.sick.com

