



Products for Process Automation

Gas Analyzers
Multi-Component Analysis Systems
Dust Monitors
Volume Flow Measuring Devices
Gas Flow Measuring Devices
Liquid Analyzers

SICK
Sensor Intelligence.

SICK Process Automation

Innovation, Technology, Service



Pollution control, health protection and climate change are areas of concern for all: SICK offers technologies and solutions for now and in the future to meet ever-changing regulations and directives. SICK is the one-stop source for modern, reliable, efficient products from project planning through installation and service.

SICK Sensor Intelligence

SICK is one of the world's leading producers of sensors and sensor solutions for industrial applications in factory and logistics automation as well as process automation segments. Always one step ahead with innovative products - continuous measurement analyzers for gases, dust and process liquids; gas flow measuring devices or systems configured to meet your application. Based on years of experience, the Process Automation division offers solutions for complex measuring tasks.

Service and Support

Consulting, planning support, detailed project planning and engineering, installation and start-up – at SICK you get everything from one source. After sales support includes service, maintenance, parts, technical assistance and training. SICK offers the complete package solution for your specific application.

Industries

- Power plants
- Cement plants
- Waste treatment
- Refineries
- Oil and natural gas
- Chemical and petrochemical
- Metal production and processing
- Biogas/biomass plants
- Pulp and paper
- Traffic and transportation
- Food and beverage



Product and System Overview

GAS ANALYZERS

- Comprehensive product range of analyzers for continuous measurement
- Years of experience in emission and process monitoring
- Technologically advanced measuring principles
- Solutions for complex measuring tasks using extractive and in-situ measurement technology

DUST MONITORS

- Low-maintenance monitors for measurement and monitoring of dust, opacity and particulate concentrations
- Simple integration into existing measuring sites
- Minimal installation and start-up requirements

FLOW MEASURING DEVICES: PROCESS

- Gas velocity and volume flow measurement
- Easy installation, wide measuring range, reliable and precise measurement
- Rugged titanium transducers for higher durability

SYSTEM DESIGN

- Customized system solutions to meet your specific application requirements
- Standard solutions and turnkey analysis units including all peripheral equipment
- Acquisition, evaluation, storage and transfer of emission data

LIQUID ANALYZERS

- Water analysis (TOC) of waste water, drinking water, surface water, process water and much more
- Measurement of IR, NIR, VIS absorbing liquids

MULTI-COMPONENT ANALYSIS SYSTEMS

- Hot measurement systems for emission applications
- Modular analysis systems using dependable components
- Solutions specific to individual applications for measuring tasks in emission and process monitoring

FLOW MEASURING DEVICES: EMISSION

- Reliable, precise flow measurements
- Gas volume flow measurement for continuous emission monitoring: versions for EPA compliance
- Leader in ultrasonic measurement technology
- Rugged titanium transducers for higher durability

FLOW MEASURING DEVICES: FLARE GAS

- Mass flow measurement for flare and vent gas applications
- Improved design for better high and low velocity measurements
- Valve leakage detection and gas identification

FLOW METERS: CUSTODY TRANSFER & PROCESS

- Ultrasonic gas flow meters (suitable for virtually all gases)
- High accuracy measurement (0.1% or reading)
- Path layout without reflection - 2 to 4 measuring paths
- Combination fiscal meter and check meter available
- Solar powered with integrated LCD display

AUTOMOTIVE

- Mobile, compact measuring systems for efficient exhaust gas measurement on vehicle engines

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Process Automation

Major Industries Served



Flow



Power



Cement



Waste Incineration



Steel



Chemical

Extractive Analyzers

- Measurement of multiple components
- Optimally configurable analyzers for versatile applications
- Precise measuring results through proven measuring principles
- Detection of aggressive, corrosive or combustible gases
- Explosion protected versions for zone 1 and zone 2



GAS ANALYZERS-EXTRACTIVE		GMS800 SERIES	DEFOR
		Modular gas analyzer, up to 4 components	Modular UV gas analyzer, up to 3 components
Measuring principle		NDIR, UV Paramagnetic/electrochemical (O ₂) Interference filter correlation Thermal conductivity	UV Resonance Absorption Spectrometry (UVRAS)
Measuring components		CO, CO ₂ , SO ₂ , NO, NH ₃ , H ₂ , N ₂ O, CH ₄ , C ₂ H ₂ , C ₂ H ₄ , C ₂ H ₆ , C ₃ H ₆ , C ₃ H ₈ , C ₄ H ₆ , C ₄ H ₁₀ , C ₆ H ₁₄ , O ₂ and many more	Cl ₂ , NO, NO ₂ , SO ₂ , NH ₃ , CS ₂ , COS, H ₂ S, O ₂ , H ₂
Measuring task, application		Emission and process monitoring Standard equipment with up to 3 analyzer modules possible. 6 different analyzer modules are available for analyzing more than 60 gas components. Single or simultaneous measurement of up to 5 components	Emission measurement, for example, of low NO concentrations in power plants or gas turbines, NOx monitoring in DeNOx plants, emission monitoring in the pulp and paper industry Process monitoring, for example, of Cl ₂ measurements, sulfur compounds in process gas, NO, NO ₂ , NH ₃ measurements in applications with nitric acid, high H ₂ S concentrations in reactive or acidic gases; additionally, measurement of O ₂ and H ₂ with auxiliary modules
Advantages		<ul style="list-style-type: none"> • Compact analyzer • Explosion protected version optional • Fully automatic measuring mode • Low maintenance, easy to use • Flexible configuration options through a variety of analog/digital interfaces • Monitoring of external status signals 	<ul style="list-style-type: none"> • Simultaneous measurement of NO and NO₂ with subsequent compilation • Long service life of UV lamp (typically 2 years) • Low drifts and high stability • True reference measurement for low-drift, stable measurement • All modules "temperature controlled", making them independent of ambient temperature fluctuations
Compliances, regulations		EPA, CE, 2000/76/EC 2001/80/EC, 27 th FICA ^{*)} , EN 14181, GOST, MCERTS, TI Air, cCSA _{US}	EPA, CE, ATEX
Measuring location			
Model		<ul style="list-style-type: none"> • Enclosure GMS810: 19" rack mount housing • Enclosure GMS815P: Easy to install wall housing, also for use in explosion zone 1 and zone 2 • Enclosure GMS820P: Pressurized housing for use in explosion zone 1 and zone 2 	<ul style="list-style-type: none"> • 19" rack mount housing • Wall housing
Maintenance, repairs		<ul style="list-style-type: none"> • With calibration cells (option), calibration possible (IR and UV) • Low maintenance requirements • Able to fulfill QAL3 regulations 	<ul style="list-style-type: none"> • Low maintenance, no converter function check during NO and NO₂ measurement • No test gases required when the optional adjustment unit is used

^{*)} FICA = Federal Implementation of Clean Air Act



FIDOR	SIDOR	GME700
THC analyzer	NDIR gas analyzer, 2 IR components plus O₂	Laser analyzer
FID Flame Ionization Detection	NDIR absorption Paramagnetic/Electrochemical (O₂)	Laser spectroscopy (TDLs)
CnH _M	CH ₄ , CO, CO ₂ , NO, SO ₂ , O ₂	HCl, HF, NH ₃ , O ₂ , NH ₃ /H ₂ O, HCl/H ₂ O
Continuous monitoring of hydrocarbon emissions in cement, power and waste incineration plants Process Monitoring	Emission and operational applications Incineration optimization of small boilers Single or simultaneous measurement of up to 2 IR gas components and, additionally, O ₂ using auxiliary modules Landfill and biogas monitoring (ATEX)	Emission monitoring, for example in fertilizer production, waste incineration, aluminium and building material industry NH ₃ slip monitoring in DeNO _x plants Scrubber monitoring in the iron and steel industry, ammonia measurement in urea production Hydrochloric acid measurement in raw gas before the scrubber in waste incineration plants
<ul style="list-style-type: none"> Measures THC concentrations in gases at trace levels as well as high concentrations High availability of 99.5% Remote diagnostics Modular design for integration into existing cabinets 	<ul style="list-style-type: none"> Low test gas consumption (feeding 6 months minimum) with a long term stable measuring cell High selectivity and measuring sensitivity Automatic readjustment with component-free ambient air Simple maintenance, can be repaired locally 	<ul style="list-style-type: none"> Compact system without moving parts High spectral resolution Wave length stability Drift and calibration-free "Hot/wet" extractive analyzer
EPA, EN 15267.3, EN 14181, TA air, 27th FICA, (BImSchO), MCERTS	EPA Part 60 & Part 75, CE, ATEX, cCSA _{US} , 2001/80/EC, 27 th FICA ^{*)} , EN 14181, GOST, MCERTS, TI Air,	EPA, CE, GOST
<ul style="list-style-type: none"> 19" rack mount housing Integrated catalytic converter (option) Provides clean zero gas 	<ul style="list-style-type: none"> 19" rack mount housing 	<ul style="list-style-type: none"> Extractive version 19" rack mounting
<ul style="list-style-type: none"> Maintenance free ejector pump Minimal maintenance-no moving parts 	<ul style="list-style-type: none"> Calibration possible with ambient air, test gases required only every 6 months Low maintenance Able to fulfill QAL3 regulations 	<ul style="list-style-type: none"> Low maintenance requirements

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Extractive Analyzers



GAS ANALYZERS-EXTRACTIVE		MCS300P	EUROFID
		Multi-component process analyzer, up to 6 components plus O₂	Total hydrocarbon analyzer
Measuring principle		Single-beam photometry Bifrequency and gas filter correlation	Flame ionization detector
Measuring components		IR, NIR, VIS absorbing gases, for example, CO, CO ₂ , NO, NO ₂ , N ₂ O, HCl, NH ₃ , H ₂ O, hydrocarbons, Cl ₂	Total hydrocarbon (C _{org})
Measuring task, application		In production plants in the chemical industry Raw gas measurement for control of exhaust gas in purification plants, such as waste incineration and multifuel furnace plants	Exhaust gas measurement of VOC emissions in raw and clean gases Emission monitoring in waste incineration plants and cement plants or thermal, catalytic or biological exhaust air purification plants LEL monitoring in production and processing of products containing solvents Workplace monitoring and VOC measurements in the ambient air
Advantages		<ul style="list-style-type: none"> • Proven sample cuvettes for corrosive, aggressive sample gases • Process cuvettes with integrated protection devices • Robust system with hot measurement method for trouble-free acquisition of very high raw gas concentrations • Can be used reliably even at a high acid dew point • Short reaction times (≤ 1 minute) and variable measuring ranges from very low (ppm) to high (% by volume) concentrations 	<ul style="list-style-type: none"> • No moving parts means no wear and tear • Integrated sample gas dilution • Overpressure method for minimum errors • All gas paths heated: no condensation in the analyzer • EC type approval as gas detector according to 94/9/EC
Compliances, regulations		CE, EMC 2004/108/EC, Low Voltage Directive 2006/95/EC	EPA, ATEX, CE, 2000/76/EC EN 14181, MCERTS, GOST, TI Air
Measuring location			
Model		<ul style="list-style-type: none"> • Compact process analyzer for easy wall fitting • Raw gas measuring system: Analysis cabinet version 	<ul style="list-style-type: none"> • Inline configuration for direct duct installation
Maintenance, repairs		<ul style="list-style-type: none"> • Low maintenance requirements • Automatic check cycle for zero and reference point monitoring • Adjusting filter wheel (option) for a quick check without test gas 	<ul style="list-style-type: none"> • Low maintenance requirements (replacement of gas filter) • Able to fulfill QAL3 regulations

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FID3006	MONOCOLOR
Portable total hydrocarbon analyzer	Hydrogen sulfide gas analyzer
Flame ionization detector	Colorimetry (discoloring of test paper)
Total hydrocarbon (C _{org})	H ₂ S
Exhaust gas measurements of VOC emissions in raw and clean gases (same as EuroFID) Compact, portable unit for flexible use Measurement of organic substances even at measuring points difficult to access	Monitoring hydrogen sulfide in natural gas, biogas, land fill gas, coke oven gas Ambient air monitoring Emission measurement in desulphurization plants, pulp and paper industry, chemical and petrochemical industry
<ul style="list-style-type: none"> Automatic fuel gas switch-off when flame extinguished Precise measurement through patented analysis chamber Low fuel gas consumption Low operating costs Short warm up time Complete accessories program 	<ul style="list-style-type: none"> Quasi-continuous, colorimetric measuring principle with dry reaction on a test paper strip Very selective measuring method even if other sulfur compounds are in the sample gas; measurement of very low H₂S concentrations
EPA, CSA, UL, CE, 2 nd FICA ^{*)} , 2000/76/EC MCERTS, TI Air	CE, GOST
<ul style="list-style-type: none"> No mounting – mobile device 	<ul style="list-style-type: none"> Version MONOCOLOR 1N: 19" rack for use in non-ex areas Version MONOCOLOR 2Ex: Wall-mounted housing for use in ex zone 1, IP 65, EEx de (ib) IIB T4
<ul style="list-style-type: none"> Low maintenance requirements (replacement of gas filter) Able to fulfill QAL3 regulations 	

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In-Situ Analyzers

- Fast, continuous measurement directly at the measuring location (in-situ)
- No sampling required
- Very low reaction times
- Very low maintenance requirements
- Representative measurement across the complete duct cross-section



GAS ANALYZERS-IN-SITU		GM 32	GM 35
		Multi-component analyzer up to 6 components	Multi-component analyzer up to 5 components
Measuring principle		UV spectroscopy DOAS evaluation method PT1000, piezo-resistive	Filter correlation (IR) Gas filter correlation PT1000, piezo-resistive
Measuring components		SO ₂ , NO, NO ₂ , NH ₃ , temperature, pressure O ₂ (option)	CO, CO ₂ , H ₂ O, temperature, pressure
Measuring task, application		Control for flue gas purification (desulphurization and denitrification plants, scrubber and converter systems) Emission monitoring (according to local regulations) Monitoring process parameters (Claus plant, monitoring landfill gases, ammonia production)	For efficient control of incineration processes and drying plants as well as emission monitoring, for example, in cement plants Control of water injection before electric filters Monitoring incineration efficiency in special waste incineration Process monitoring in urea production
Advantages		<ul style="list-style-type: none"> • Representative measurement across the duct cross-section (cross-duct) • Ideal for aggressive or very hot gases – no duct installations • Lowest measuring ranges for large duct cross-sections • Due to probe technology, installation on one side only, for high dust concentrations or turbulent gas flows 	<ul style="list-style-type: none"> • Representative measurement across the complete duct cross-section (cross-duct) • Ideal for aggressive or very hot gases • Lowest measuring ranges for large duct cross-sections • Due to probe technology, installation on one side only, for high dust concentrations or turbulent gas flows
Compliances, regulations		EPA CFR 40 Part 60 & Part 75 (probe version only), 2001/80/EC, 2000/76/EC, plants of the 27 th FICA ^{*)} , EN 15267-3, EN 14181 and DIN ISO 14956	EPA CFR 40 Part 60, 75 and 29 CFR 1310, 2001/80/EC, 2000/76/EC, 27 th FICA ^{*)} , MCERTS, GOST, TI Air
Measuring location			
Model		<ul style="list-style-type: none"> • Configuration with probe: Installation on one side • Cross-duct configuration: Installation on both sides (opposite each other) 	<ul style="list-style-type: none"> • Configuration with probe: Installation on one side • Cross-duct configuration: Installation on both sides (opposite each other)
Maintenance, repairs		<ul style="list-style-type: none"> • Low maintenance requirements • Able to fulfill QAL3 regulations • Cleaning of optical windows only: Intervals approximately 3 to 6 months 	<ul style="list-style-type: none"> • Low maintenance requirements • Able to fulfill QAL3 regulations • Zero point control and cleaning of optical interfaces: Intervals approximately 3 to 6 months

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GM700
ProbeGM700
CrossDuct**GM700****Laser analyzer**

Laser spectroscopy (TDLS)	Gas filter correlation
HCl, HF, NH ₃ , O ₂ , NH ₃ /H ₂ O, HCl/H ₂ O	CO
Emission monitoring, for example in fertilizer production, waste incineration, aluminium and building material industry NH ₃ slip monitoring in DeNO _x plants Scrubber monitoring in the iron and steel industry, ammonia measurement in urea production Hydrochloric acid measurement in raw gas before the scrubber in waste incineration plants	Process control, for example, for monitoring incineration plants in the power plant industry, cement industry, steel industry or chemical industry For difficult measuring tasks (high dust loads, overpressure, "wet" flue gases, extremely high gas concentrations)
<ul style="list-style-type: none"> • Compact system without moving parts • High spectral resolution • Wave length stability • Drift and calibration-free • Gas test possible (with gas diffusion probe) 	<ul style="list-style-type: none"> • Fast and easy installation and start-up • Easy operation directly on the evaluation unit • Measured value, measuring range and limit value can be read off directly • Very low maintenance requirements
EPA, CE, GOST	CE
<ul style="list-style-type: none"> • Configuration with probe: Installation on one side • Cross-duct configuration: Installation on both sides (opposite each other) 	<ul style="list-style-type: none"> • Cross-duct configuration: Installation on both sides (opposite each other)
<ul style="list-style-type: none"> • Low maintenance requirements • Cleaning of optical windows only: Intervals approximately 3 to 6 months 	<ul style="list-style-type: none"> • Low maintenance requirements • Zero point control and cleaning of optical interfaces: Intervals approximately 3 to 6 months



In-Situ Analyzers



GAS ANALYZERS-IN-SITU	ZIRKOR302	TRANSIC100LP
	Oxygen analyzer	Oxygen transmitter
Measuring principle	Zirconium dioxide (current sensor)	TDLS (Tunable Diode Laser Spectroscopy)
Measuring components	O ₂	O ₂
Measuring task, application	Optimizing industrial incineration processes and calculation of reference values Used, for example, in power and heating plants, waste incineration plants, crucible furnaces, lime cement kilns, curing ovens, sintering, melting and tempering furnaces	Inert blanketing applications O ₂ measurement in ambient conditions Rugged replacement for extractive paramagnetic analyzer
Advantages	<ul style="list-style-type: none"> Extendable: up to three O₂ analyzers can be connected to one evaluation unit Short reaction time for process control Temperatures up to 2,550 °F (1,400 °C) Fixed physical zero point Automatic calibration No calibration gas required; calibration gas = ambient air 	<ul style="list-style-type: none"> General purpose or hazardous area versions Low cost O₂ measurement
Compliances, regulations	EPA, 2001/80/EC, 2000/76/EC, GOST, TI Air	
Measuring location		
Model	<ul style="list-style-type: none"> Probe technology: Installation on one side 	<ul style="list-style-type: none"> In-situ probe Wall mount for ambient monitoring Sample cell for harsh conditions
Maintenance, repairs	<ul style="list-style-type: none"> Low maintenance requirements Able to fulfill QAL3 regulations Intervals approximately 3 to 6 months 	<ul style="list-style-type: none"> Low maintenance requirements

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Multi-Component Analysis Systems

- Efficient standard systems for typical emission applications
- Systems configured according to customer specifications for many process applications
- Simple retrofitting, easy installation and start-up
- Compact and sturdy design



MULTI-COMPONENT ANALYSIS SYSTEMS	MERCEM300Z	MCS100E HW/PD/CD
	Mercury analysis system	Multi-component analysis system, more than 10 components
Measuring principle	Atomic absorption, spectroscopy, Zeeman principle	Single-beam photometer, bifrequency and gas filter correlation method
Measuring components	Hg	Simultaneous measurement of up to 8 IR absorbing gas components MCSO ₃ version for SO ₃ measurement
Measuring task, application	Detection of elemental and ionic mercury	Continuous monitoring of flue gases, for example, in waste incineration and multi-fuel furnace plants, cement plants, power plants, also with additional fuels, plants with chemical incineration, aluminium production, steel and iron production as well as smelting and industrial exhaust air MCS100E system variants: <ul style="list-style-type: none"> • MCS100E-HW for raw gas/clean gas monitoring with hot measurement method, also with high acid dew point • MCS100E-PD and -CD for very small measuring ranges, especially for SO₂, NO, NO₂
Advantages	<ul style="list-style-type: none"> • Detection of elemental and ionic mercury • Automatic zero and test gas • Reliable, proven systems • Very low maintenance requirements • Several measuring points with one system • Integrated calibrator function, can also be performed with internal calibration filter – no test gas required 	<ul style="list-style-type: none"> • Automatic zero and test gas feeding • Reliable, proven systems • Very low maintenance requirements • Several measuring points with one system • Integrated QAL3 function, can also be performed with internal calibration filter – no test gas required
Compliances, regulations	EPA PS12A, 2000/76/EC, MCERTS, TI Air	EPA, 2001/80/EC, 2000/76/EC, MCERTS, GOST, TI Air, EN 15267-3, EN 14181
Measuring location		
Model	<ul style="list-style-type: none"> • Sample gas pump • Analyzer • Outdoor installation • System control unit 	<ul style="list-style-type: none"> • MCS100E: compact analyzer in a housing • MCS100E System in a cabinet: <ul style="list-style-type: none"> – Sample gas transportation and conditioning (sample gas cooler/permeation dryer, pump) – MCS100E analyzer – Temperature control – FID (optional)
Maintenance, repairs	<ul style="list-style-type: none"> • Maintenance intervals greater than 6 months • EPA Compliant 	<ul style="list-style-type: none"> • Low maintenance requirements • Able to fulfill QAL3 regulations



MULTI-COMPONENT ANALYSIS SYSTEMS		
	MKAS	MKAS COMPACT
	Modular multi-component analysis system	Multi-component analysis system
Measuring principle	Depending on the built-in analyzers (GMS810, SIDOR, DEFOR)	Depending on the built-in analyzers (GMS810, SIDOR, DEFOR)
Measuring components	Depending on the built-in analyzer, for example: CO, NO, SO ₂ , CO ₂ , H ₂ , CH ₄ , O ₂ and others	Depending on the built-in analyzer, for example: CO, NO, SO ₂ , CO ₂ , H ₂ , CH ₄ , O ₂ and others
Measuring task, application	Emission measurements MKAS system versions: <ul style="list-style-type: none"> • MKAS Basic for process measurements • MKAS Comfort – automatic measuring system (AMS) for emission monitoring in compliance with EPA standards • MKAS Multipoint with sample point switching function from 2 to 8 sample points • MKAS Twin – space saving parallel analysis of 2 emission sample points • MKAS HD – heavy-duty system suitable for high concentrations, acidic or extremely dusty sample gases 	A complete, very compact analysis system <ul style="list-style-type: none"> • Compact and intelligent integrated cabinet solution for the installation of a standard analyzer (19")
Advantages	<ul style="list-style-type: none"> • Sturdy analysis system based on established standard components • Easy to upgrade or retrofit due to modular concept • Optimized sample gas cooler (one or two stage operation) including condensate pump, filter and flow meter • Intelligent sample point switching (2...8 sample points) • Complete system mounted in a sheet steel or GRP cabinet: wired, tested and ready for use 	<ul style="list-style-type: none"> • Cost effective price/performance ratio • Economical solution due to favorable purchasing costs and low maintenance requirements
Compliances, regulations	Depending on the built-in analyzer	Depending on the built-in analyzer
Measuring location		
Model	<ul style="list-style-type: none"> • Up to 3 analyzers with up to 12 measuring components • High performance sample gas cooler • Heated sample gas line, probe • Control systems for heating circuits • Air conditioner or fan • Sample point switching • NO_x converter • Matching filters and sample gas pumps 	<ul style="list-style-type: none"> • Analyzer (GMS810, DEFOR or SIDOR) • Gas cooler (1-stage) • Sample gas pump • Heat controller
Maintenance, repairs	<ul style="list-style-type: none"> • Low maintenance requirements 	<ul style="list-style-type: none"> • Low maintenance requirements

**SCP3000****Gas sampling system****MCS100FT****Multi-component analysis system,
more than 10 components simultaneously**

	FTIR spectroscopy
Up to 6 compounds plus oxygen (e.g. CO, NO, HCl, SO ₂ , CO ₂ , NH ₃ , O ₂)	HF, HCl, SO ₂ , NO, NO ₂ , NO _x , CO, NH ₃ , N ₂ O, CH ₄ and additionally CO ₂ , H ₂ O, O ₂ and VOC
Process gas analysis at the inlet of the cement kiln.	Continuous emission measurements, for example, in waste incineration and multi-fuel furnace plants, cement plants, power plants, also with additional fuels, plants with chemical incineration as well as aluminium production, steel and iron production
<ul style="list-style-type: none"> Hot wet measurement technique ensures sample remains above water and acid dew point Anti-stick probe cleaning system MCS300P combined with SCP3000 offers a reliable analysis system for kiln inlet measurements 	<ul style="list-style-type: none"> Sturdy analysis system based on standardized system technology according to the hot measurement method True monitoring of strict HF limit values from 0...3.0 mg/m³ Specially optimized analysis, from sampling to the sample gas cell FTIR technology (Cube Corner interferometer): precise and reliable measuring results Complies with the minimum requirements of Directive EN 15267-3 (QAL1) and the EN 14181 requirements for QAL2 and QAL3
<ul style="list-style-type: none"> EN15267-3, EN14181, EN 60204-1 	EPA, 2001/80/EC, 2000/76/EC, TI Air, EN 15267-3, EN 14181
<ul style="list-style-type: none"> Gas sampling probe with retraction unit Dust proof rotation drive Integrated cooling unit MCS300P "hot-wet" analysis system Shock blower 	<ul style="list-style-type: none"> FTIR analyzer Heated measuring gas cell Electronics IO modules System control unit for operation FID unit (optional)
<ul style="list-style-type: none"> Quick and easy maintenance Long maintenance intervals 	<ul style="list-style-type: none"> Low maintenance requirements Able to fulfill QAL3 regulations



Dust Monitors

- New standards in dust measurement technology with sturdy, low-maintenance dust monitors
- Simple integration into existing measuring locations
- Minimal installation and start-up requirements
- Measurements using the principles of transmissometry, scattered light and gravimetric comparison measurement



DUST MONITORS	DUSTHUNTER T	DUSTHUNTER S
	Modular dust monitor in 3 configurations: T50, T100, T200	Modular dust monitor in 4 configurations: SB50, SB100, SP100, SF100
Measuring principle	Transmissometry	Scattered light
Measuring components	Transmission, opacity, extinction, dust concentration	Dust concentration
Measuring task, application	Emission monitoring, for example, in power plants and heating plants, waste incineration plants and waste disposal, metal processing (steel and aluminum plants, smelting works, foundries), cement production. Monitoring of filter systems Measurement of dust concentration in exhaust gas and exhaust air ducts before and after dust filters Monitoring of the dust load in workshops, control of exhaust air/fresh air systems	Emission monitoring, for example, in power plants and heating plants, waste incineration plants and waste disposal, metal processing (steel and aluminum plants, smelting works, foundries), cement production. Monitoring of filter systems Measurement of dust concentration in exhaust gas and exhaust air ducts before and after dust filters
Advantages	<ul style="list-style-type: none"> • Application for medium to high dust concentrations with small to large active measuring paths <ul style="list-style-type: none"> – Automatic zero and reference point measurement and contamination measurement and correction (T100, T200) – Automatic self-alignment of optical axis (T200) • Measurement of dust concentrations regardless of gas velocity, moisture or charging of the particles • Simple installation and start-up as well as easy operation • Long maintenance intervals • Status-dependent maintenance message • Inputs/outputs extendable with additional modules 	<ul style="list-style-type: none"> • Application for low and medium dust concentrations <ul style="list-style-type: none"> – One-sided installation, no light absorber – Automatic zero and reference point measurement – Contamination measurement and correction (SB100, SP100, SF100) • Measurement of dust concentrations regardless of gas velocity, moisture or charging of the particles • Simple installation (one-sided installation, except SF100) and start-up as well as easy operation • Long maintenance intervals • Status-dependent maintenance message • Inputs/outputs extendable with additional modules
Compliances, regulations	EPA PS-1 (T100, T200), 2001/80/EC, 2000/76/EC, MCERTS, GOST (in preparation), EN 15267-3, EN 14181	EPA PS-11 (SB100, SP100, SF100), 2001/80/EC, 2000/76/EC and plants of the 27 th FICA ^{*)} , MCERTS, GOST (in preparation), EN 15267-3, EN 14181
Measuring location		
System components	<ul style="list-style-type: none"> • Sender/receiver unit • Reflector • MCU-P control unit with integrated purge air or • MCU-N control unit and external purge air (option) 	<ul style="list-style-type: none"> • Sender/receiver unit • For SF100 only: Sender unit, scattered light receiver • MCU-P control unit with integrated purge air or • MCU-N control unit and external purge air (option)
Maintenance, repairs	<ul style="list-style-type: none"> • Low maintenance requirements • Able to fulfill QAL3 regulations • Cleaning of optical windows only: Intervals approximately 3 to 6 months 	<ul style="list-style-type: none"> • Low maintenance requirements • Able to fulfill QAL3 regulations • Cleaning of optical windows only: Intervals approximately 3 to 6 months

^{*)} FICA = Federal Implementation of Clean Air Act



DUSTHUNTER C	FWE200	GRAVIMAT SHC500
Combined measuring device with two measuring principles C200	Particulate monitor for wet gas	Mobile dust measuring system
Transmissometry, scattered light	Scattered light	Gravimetry
Transmission, opacity, extinction, dust concentration	Dust concentration	Dust concentration
Emission monitoring, for example, in power plants and heating plants, waste incineration plants and waste disposal, metal processing (steel and aluminum plants, smelting works, foundries), cement production. Monitoring of filter systems Measurement of dust concentration in exhaust gas and exhaust air ducts before and after dust filters	In saturated gas downstream of desulphurization plants In wet scrubbing plants, e.g. of waste incineration plants Registration of dust concentrations in wet exhaust air from technological processes of different industries	Calibration of continuous dust measuring systems Performance measurements at filter plants Non-continuous control measurements Flow and temperature profile measurements, determination of the flow direction (turbulence)
<ul style="list-style-type: none"> • Application for very low and high dust concentrations • Redundant dust measurement by combination of both measuring principles (transmissometry, scattered light) • Reliable application through redundant measuring technology • Self-monitoring function • Scattered light measuring principle for very low dust concentrations ($< 5 \text{ mg/m}^3$) • Transmission measuring principle for high dust concentrations ($< 10,000 \text{ mg/m}^3$) • Contamination measurement and correction on both sides • Long maintenance intervals • Designed for future regulations: decreasing limit values and changing concentrations 	<ul style="list-style-type: none"> • Extractive dust measurement for very low to medium concentrations • Automatic test cycle of zero point and reference point • Gas sampling and gas recirculation combined in one probe • Automatic check of zero and reference point; contamination monitoring • Easy installation and assembly due to compact design 	<ul style="list-style-type: none"> • No dust losses during filter handling • Highest measuring accuracy also at low level dust concentrations • Automatic data recording and system control • Isokinetic control in real time • Automatic storage and evaluation of measured values • Measurement results immediately available after sampling • Automatic measurement of the flow angle • Detection of turbulence effects • Compact design, minimal components
EPA PS-1 & PS-11, 2001/80/EC, 2000/76/EC and plants of the 27 th FICA ^{*)} , MCERTS, GOST (in preparation), EN 15267-3, EN 14181	EPS PS-11, 2001/80/EC, 2000/76/EC, MCERTS	EPA Method 17, VDI 2066/EN 13284-1, GOST
<ul style="list-style-type: none"> • Sender/receiver unit • Reflector/scattered light receiver • MCU-P control unit with integrated purge air or • MCU-N control unit and external purge air (option) 	<ul style="list-style-type: none"> • Measuring and control unit • Thermo cyclone • Blower unit 	<ul style="list-style-type: none"> • Automatic unit • Filter head probe GS5
<ul style="list-style-type: none"> • Low maintenance requirements • Able to fulfill QAL3 regulations • Cleaning of optical windows only: Intervals approximately 3 to 6 months 	<ul style="list-style-type: none"> • Low maintenance requirements – depending on application conditions 	<ul style="list-style-type: none"> • Low maintenance requirements

^{*)} FICA = Federal Implementation of Clean Air Act

Emission Monitoring

- Exact, continuous measurement of exhaust gas volume flow
- Rugged titanium transducer for high durability
- Measuring results independent of pressure, temperature and gas composition
- No moving parts, therefore very low maintenance requirements
- No interference on flow, minimal loss of pressure



FLOW MEASUREMENT FOR EMISSION MONITORING	FLAWSIC100 H	FLAWSIC100 M
	High Power	Medium Power
Measuring principle	Measurement of difference in ultrasonic transit time	Measurement of difference in ultrasonic transit time
Measured variables	Gas velocity, volume flow (act. ^{*)}), volume flow (std. ^{**}), gas temperature, sound velocity	Gas velocity, volume flow (act. ^{*)}), volume flow (std. ^{**}), gas temperature, sound velocity
Measuring task, application	High power version for large stacks with up to 42.7 ft (13 m) diameters Suitable for high dust application Use in aggressive gases	Medium power version, best suited for stack diameters up to 11 ft (3.4 m) Use in aggressive gases
Advantages	<ul style="list-style-type: none"> • Corrosion resistant probe materials • Innovative internal cooling ("AC" types) • Integral measurement over the entire duct diameter • Very low installation requirements, low operating costs • For gas temperatures up to 500 °F (260 °C) (standard), with internal cooling up to 840 °F (450 °C) • No purge air • Fully automatic zero and span check 	<ul style="list-style-type: none"> • Corrosion resistant probe materials • Innovative internal cooling ("AC" types) • Integral measurement over the entire duct diameter • Very low installation requirements, low operating costs • For gas temperatures up to 500 °F (260 °C) (standard), with internal cooling up to 840 °F (450 °C) • No purge air • Fully automatic zero and span check
Compliances, regulations	EPA, 2001/80/EC, 2000/76/EC, plants of the 27 th FICA ^{***}), MCERTS, GOST, TI Air, EN 15267-3	EPA, 2001/80/EC, 2000/76/EC, plants of the 27 th FICA ^{***}), MCERTS, GOST, TI Air, EN 15267-3
Measuring location		
Model	<ul style="list-style-type: none"> • Sender/receiver units • Control unit • Connection box 	<ul style="list-style-type: none"> • Sender/receiver units • Control unit • Connection box
Maintenance, repairs	Very low maintenance thanks to no moving parts, corrosion resistant probe materials and no purge air is used	Very low maintenance thanks to no moving parts, corrosion resistant probe materials and no purge air is used

^{*)} act. = in operating state; ^{**)} std. = in standard state; ^{***)} FICA = Federal Implementation of Clean Air Act



FLAWSIC100 S

Small Size

FLAWSIC100 PR

Probe Type

Measurement of difference in ultrasonic transit time	Measurement of difference in ultrasonic transit time
Gas velocity, volume flow (act. ^{*)}), volume flow (std. ^{**)}), gas temperature, sound velocity	Gas velocity, volume flow (act. ^{*)}), volume flow (std. ^{**)}), gas temperature, sound velocity
Small transducer size, optimized for small stack diameters of 0.5...5.6 ft (0.15...1.7 m) Use in aggressive gases	For stack diameters greater than 1.3 ft (0.4 m) Probe type with two transducers for installation on one side only
<ul style="list-style-type: none"> Corrosion resistant probe materials Integral measurement over the entire duct diameter Very low installation requirements, low operating costs For gas temperatures up to 300 °F (150 °C) No purge air Fully automatic zero and span check 	<ul style="list-style-type: none"> Corrosion resistant probe materials Innovative internal cooling ("AC" types) Very low installation requirements, low operating costs For gas temperatures up to 500 °F (260 °C) (standard), with internal cooling up to 660 °F (350 °C) No purge air Fully automatic zero and span check
	EPA, 2001/80/EC, 2000/76/EC, 27 th FICA ^{***}), MCERTS, EN 15267-3
<ul style="list-style-type: none"> Sender/receiver units Control unit Connection box 	<ul style="list-style-type: none"> Sender/receiver unit with probe Control unit
Very low maintenance thanks to no moving parts, corrosion resistant probe materials and no purge air is used	Very low maintenance thanks to no moving parts, corrosion resistant probe materials and no purge air is used

^{*)} act. = in operating state; ^{**) std.} = in standard state; ^{***)} FICA = Federal Implementation of Clean Air Act



Flare Gas Applications

- Exact, continuous measurement of exhaust gas volume and mass flow
- Mass flow measurement for flare and vent gas applications
- Innovative high-speed sensor design for maximum gas velocities



FLOW MEASUREMENT FOR FLARE GAS APPLICATIONS		FLOWSIC100 FLARE EX-S-RE	FLOWSIC100 FLARE EX-RE
		Gas mass flow measuring device Pipe size 4" to 18"	Gas mass flow measuring device Pipe size 6" to 72"
Measuring principle		Ultrasonic transit time measurement	Ultrasonic transit time measurement
Measured variables		Mass flow, volume flow (act.*), volume flow (std.**), molecular weight, gas volume and mass, gas velocity, gas temperature, sound velocity	Mass flow, volume flow (act.*), volume flow (std.**), molecular weight, gas volume and mass, gas velocity, gas temperature, sound velocity
Application		Cross-duct high speed version (patent pending) 90° nozzle installation Optional: Non retractable version Hermetically sealed stainless steel and titanium probes ATEX and CSA approved for use in hazardous areas	Cross-duct high power version for sound damping gas compositions Optional: Non retractable version Hermetically sealed stainless steel and titanium probes ATEX and CSA approved for use in hazardous areas
Advantages		<ul style="list-style-type: none"> • Operation under very high gas velocities using an innovative high speed sensor design • Accurate operation at low gas flow (near zero) • Easy installation procedure – welding of nozzles perpendicular to pipeline • Remote installation of control unit up to 3,300 ft (1,000 m) – serial connection • Improved accuracy – spool piece solution • Reliable device function – automatic self diagnostics and calibration check 	<ul style="list-style-type: none"> • Operation under very high gas velocities using an innovative high speed sensor design • Accurate operation at low gas flow (near zero) • Easy installation • Remote installation of control unit up to 3,300 ft (1,000 m) – serial connection • Improved accuracy – spool piece solution • Reliable device function – automatic self diagnostics and calibration check
Compliances, regulations		SR-unit Zone 1: ATEX II 2G Ex d [ia] IIC T4; ATEX II 2G Ex de [ia] IIC T4; CSA Cl I, Div1/Div2; Cl I, Zone; 1/Zone 2 Option: Temp. class T6; Zone 0 for ultrasonic transducers ATEX I/2G Ex d [ia] IIC T4 SR-unit Zone 2: ATEX II 3G Ex nA II T4 MCU control unit: Non-ex: Remote installation with up to 3,300 ft (1,000 m) distance to sample point Zone 1: ATEX II 2G Ex dIIC T4; CSA Cl, Div.1: Cl I, Zone 1 (pending) Zone 2: ATEX II 3G Ex nA II T4; CSA Cl I, Zone 2, CSA Cl, Div. 2 (pending)	SR-unit Zone 1: ATEX II 2G Ex d IIC T4; ATEX II 2G Ex de IIC T4; CSA Cl I, Div1/Div2; Cl I, Zone 1/Zone 2 Option: Temp. class T6 SR-unit Zone 2: ATEX II 3G Ex nA II T4 MCU control unit: Non-ex: Remote installation with up to 3,300 ft (1,000 m) distance to sample point Zone 1: ATEX II 2G Ex dIIC T4; CSA Cl, Div.1: Cl I, Zone 1 (pending) Zone 2: ATEX II 3G Ex nA II T4; CSA Cl I, Zone 2, CSA Cl, Div. 2 (pending)
Measuring location			
System components		<ul style="list-style-type: none"> • Sender/receiver units • Control unit 	<ul style="list-style-type: none"> • Sender/receiver units • Control unit
Maintenance, repairs		<ul style="list-style-type: none"> • Integrated zero and span check 	<ul style="list-style-type: none"> • Integrated zero and span check

* act. = in operating state; ** std. = in standard state



FLOWSIC100 FLARE EX-PR-RE

Gas mass flow measuring device Pipe size 12" to 72"

Ultrasonic transit time measurement

Mass flow, volume flow (act.^{*)}),
volume flow (std.^{**)}), molecular weight,
gas volume and mass, gas velocity,
gas temperature, sound velocity

High speed probe version (patent pending)

Single flange installation

Optional: Non retractable version

Hermetically sealed stainless steel and
titanium probes

ATEX and CSA approved for use in hazardous
areas

- Operation under very high gas velocities using an innovative high speed sensor design
- Accurate operation also at low gas flow (near zero)
- Easy installation
- Remote installation of control unit up to 3,300 ft (1,000 m) – serial connection
- Single flange installation (probe version)
- Improved accuracy – spool piece solution
- Reliable device function – automatic self diagnostics and calibration check

SR-unit Zone 1: ATEX II 2G Ex d [ia] IIC T4;
ATEX II 2G Ex de [ia] IIC T4; CSA Cl I, Div1/
Div2; Cl I, Zone; 1/Zone 2

Option: Temp. class T6; Zone 0 for ultrasonic
transducers; ATEX I/2G Ex d [ia] IIC T4

SR-unit Zone 2: ATEX II 3G Ex nA II T4

MCU control unit:

Non-ex: Remote installation with up to
3,300 ft (1,000 m) distance to sample point

Zone 1: ATEX II 2G Ex dIIC T4; CSA Cl, Div.1:
Cl I, Zone 1 (pending)

Zone 2: ATEX II 3G Ex nA II T4; CSA Cl I, Zone
2, CSA Cl, Div. 2 (pending)

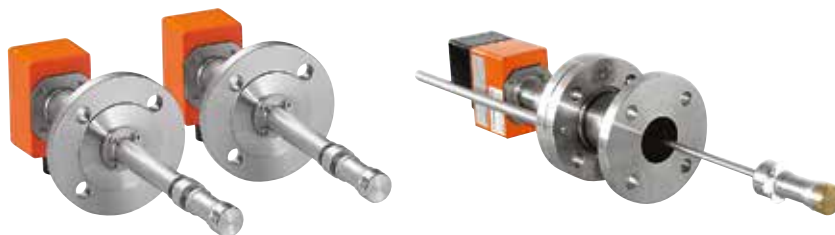
- Sender/receiver units
- Control unit

- Integrated zero and span check



Process Applications

- Exact, continuous measurement of exhaust gas volume and mass flow
- Measuring results independent of pressure, temperature and gas composition
- Probe versions for simple installation on one side only



FLOW MEASUREMENT FOR PROCESS APPLICATIONS	FLAWSIC100 PROCESS CL150	FLAWSIC100 PROCESS EX-Z2/EX-Z2-RE
	Volume flow measuring device	Volume flow measuring device
Measuring principle	Ultrasonic transit time measurement	Ultrasonic transit time measurement
Measured variables	Gas velocity, volume flow (act. ^{*)} , volume flow (std. ^{**)} , gas temperature, sound velocity, mass flow	Gas velocity, volume flow (act. ^{*)} , volume flow (std. ^{**)} , gas temperature, sound velocity, mass flow
Application	Ambient pressure up to 232 PSI (16 bar) Hermetically sealed stainless steel or titanium	Ambient pressure up to 232 PSI (16 bar) Ex-protected version for use in hazardous area zone 2 according to ATEX guideline 94/9/EC (version for zone 1 on request) Hermetically sealed stainless steel or titanium Optional: flange with retraction mechanism for sender/receiver units
Advantages	<ul style="list-style-type: none"> • Rugged transducers in stainless steel or titanium for higher durability • Corrosion resistant probe materials available for use with aggressive gases • Integral measurement over the entire duct diameter for representative measuring results (except probe version) • Contact-free measurement • No moving parts results in low maintenance • High measuring accuracy even at low gas velocity • Fully automatic zero and span check 	<ul style="list-style-type: none"> • Rugged transducers in stainless steel or titanium for higher durability • Corrosion resistant probe materials available for use with aggressive gases • Integral measurement over the entire duct diameter for representative measuring results (except probe version) • Contact-free measurement • No moving parts results in low maintenance • High measuring accuracy even at low gas velocity • Fully automatic zero and span check
Compliances, regulations	–	ATEX II 3 G EEx nA II T4 (manufacturer license); zone 1 on request
Measuring location		
System components	<ul style="list-style-type: none"> • Sender/receiver units • Control unit • Connection box 	<ul style="list-style-type: none"> • Sender/receiver units • Control unit • Optional: flange with retraction mechanism for sender/receiver units
Maintenance, repairs	<ul style="list-style-type: none"> • Integrated zero and span check 	<ul style="list-style-type: none"> • Integrated zero and span check

^{*)} act. = in operating state; ^{**)} std. = in standard state



FLOWSIC100 PROCESS PR-EX-Z2

Volume flow measuring device

Ultrasonic transit time measurement
Gas velocity, volume flow (act.*), volume flow (std.*), gas temperature, sound velocity, mass flow
Ambient pressure up to 1.45 PSI (0.1 bar) Ex-protected probe version for use in hazardous area zone 2 according to ATEX guideline 94/9/EC Material: Stainless steel or titanium Installation on one duct side only
<ul style="list-style-type: none"> Rugged transducers in stainless steel or titanium for higher durability Corrosion resistant probe materials available for use with aggressive gases Integral measurement over the entire duct diameter for representative measuring results (except probe version) Contact-free measurement No moving parts results in low maintenance High measuring accuracy even at gas velocity near zero Fully automatic zero and span check
ATEX II 3 G EEx nA II T4 (manufacturer license)
<ul style="list-style-type: none"> Sender/receiver units Control unit
<ul style="list-style-type: none"> Integrated zero and span check

System Design

- Custom solutions or standard components
- Complete equipment package
- Factory Acceptance Test available
- Best Solutions
- Detailed consulting based on experience with many system solutions



SYSTEM DESIGN

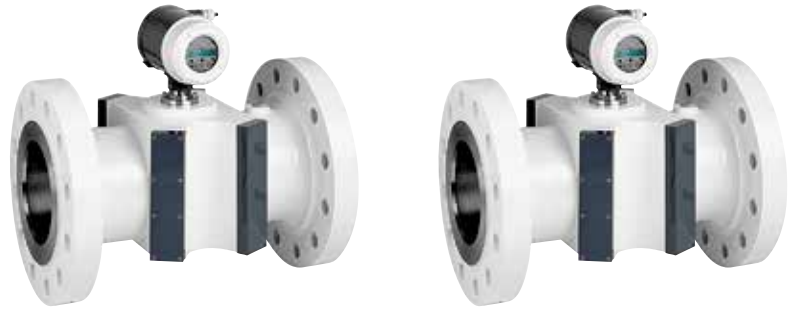
SYSTEM DESIGN

Custom solutions or standard components

Technology	Integration of various measuring principles and methods
Components, system	Up-to-date analyzers and systems Data processing and remote monitoring components included Comprehensive selection of measuring devices
Application	Stand-alone operation of measuring units Integration of complex measuring systems as turnkey Emission monitoring – from sample gas sampling to data evaluation Economical process monitoring Application in explosion-protected areas
Advantages	<ul style="list-style-type: none"> Custom systems in compliance with international and local requirements International presence – local experts available Systems configured according to customer specifications for many process applications Interfaces can be easily integrated Easy retrofitting, installation and start-up Many years of industrial experience Complex solutions from one source
Compliances, regulations	Measuring systems compliant with the respective provisions and directives
Installation location	
Model	<ul style="list-style-type: none"> Complete analysis units Complete equipment, from gas sampling and analysis to data evaluation
Project management	<ul style="list-style-type: none"> Planning, engineering and production Project management in close cooperation with the customer Best Solutions

Gas Flow Meters for Custody Transfer and Process Applications

- Gas flow measurements at the highest level of accuracy
- Path layout without reflection
- Efficient sealed titanium transducers for almost all industrial requirements
- Fully automated, integrated diagnostics with advanced MEPAFLOW600 CBM software for condition based maintenance



ULTRASONIC FLOW METERS	FLOWSIC600 2-PATH	FLOWSIC600 4-PATH
	Ultrasonic gas meter 2"...48"	Ultrasonic gas meter 3"...48"
Measuring principle	Ultrasonic transit-time difference	Ultrasonic transit-time difference
Measured variables	Gas volume flow rate and accumulation, gas speed of sound	Gas volume flow rate and accumulation, gas speed of sound
Application	2 measuring paths 2"...48"/DN50...DN1200 Measurement uncertainty $\pm 1\%$ Integrated and fully automated performance monitoring	4 measuring paths 3"...48"/DN80...DN1200 Measurement uncertainty $\pm 0.2\%$ Integrated and fully automated performance monitoring
Advantages	<ul style="list-style-type: none"> • Bidirectional measurement with no pressure loss • Path layout without reflection • Highly efficient, totally sealed titanium ultrasonic transducers • Virtually insensitive to ultrasonic noise • Large measuring range up to 1:120 • Not damaged by overload • 3 integrated logbooks and 3 data logs with 6 volume counters • Intelligent fully automated self-diagnosis • Power consumption $< 1\text{ W}$ • Capability of operating from atmospheric to beyond 6,000 psig 	<ul style="list-style-type: none"> • Bidirectional measurement with no pressure loss • Path layout without reflection • Highly efficient, totally sealed titanium ultrasonic transducers • Virtually insensitive to ultrasonic noise • Large measuring range up to 1:120 • Not damaged by overload • 3 integrated logbooks and 3 data logs with 6 volume counters • Intelligent fully automated self-diagnosis • Power consumption $< 1\text{ W}$ • Capability of operating from atmospheric to beyond 6,000 psig
Compliances, regulations	AGA, ATEX, CSA, PED	AGA, ATEX, CSA, Ped, OIML, AGA, PTB, NMi, GOST, Measurement Canada
Measuring location	Mid radius	Westinghouse path configuration
Model	<ul style="list-style-type: none"> • Measuring sensor (meter body) • Measuring transducer (electronics) • Ultrasonic sensors 	<ul style="list-style-type: none"> • Measuring sensor (meter body) • Measuring transducer (electronics) • Ultrasonic sensors
Maintenance, repairs	<ul style="list-style-type: none"> • No cyclic maintenance 	<ul style="list-style-type: none"> • No cyclic maintenance

^{*)} act. = in operating state

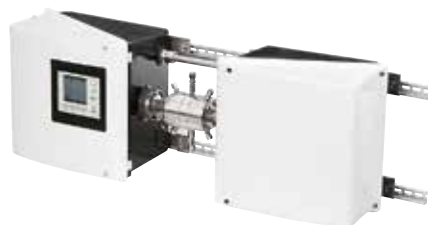


	FLOWSIC600 2PLEX (4+1)	FLOWSIC600 QUATRO (4+4)
	Ultrasonic gas meter 3"...48"	Ultrasonic gas meter 3"...48"
Measuring principle	Ultrasonic transit-time difference	Ultrasonic transit-time difference
Measured variables	Gas volume flow rate and accumulation, gas speed of sound	Gas volume flow rate and accumulation, gas speed of sound
Application	4 + 1 measuring paths 3"...48"/DN80...DN1200 Measurement uncertainty $\pm 0.2\%$ Integrated and fully automated performance monitoring Condition based maintenance by monitoring the installation close to the meter (contamination, blockage and pulsation) Redundancy	4 + 4 measuring paths 3"...48"/DN80...DN1200 Measurement uncertainty $\pm 0.2\%$ Integrated and fully automated performance monitoring 2 independent fiscal meters in one meter body
Advantages	<ul style="list-style-type: none"> • Bidirectional measurement with no pressure loss • Path layout without reflection • Highly efficient, totally sealed titanium ultrasonic transducers • Virtually insensitive to ultrasonic noise • Large measuring range up to 1:120 • Not damaged by overload • 3 integrated logbooks and 3 data logs with 6 volume counters • Intelligent fully automated self-diagnosis • Power consumption <1 W • Capability of operating from atmospheric to beyond 6,000 psig 	<ul style="list-style-type: none"> • Bidirectional measurement with no pressure loss • Path layout without reflection • Highly efficient, totally sealed titanium ultrasonic transducers • Virtually insensitive to ultrasonic noise • Large measuring range up to 1:120 • Not damaged by overload • 3 integrated logbooks and 3 data logs with 6 volume counters • Intelligent fully automated self-diagnosis • Power consumption <1 W • Capability of operating from atmospheric to beyond 6,000 psig
Compliances, regulations	AGA, ATEX, CSA, Ped , OIML, PTB, NMI, GOST, Measurement Canada	AGA, ATEX, CSA, Ped , OIML, PTB, NMI, GOST, Measurement Canada
Measuring location	Westinghouse/centerline	Westinghouse path configuration
Model	<ul style="list-style-type: none"> • Measuring sensor (meter body) • Measuring transducer (electronics) • Ultrasonic sensors 	<ul style="list-style-type: none"> • Measuring sensor (meter body) • Measuring transducer (electronics) • Ultrasonic sensors
Maintenance, repairs	<ul style="list-style-type: none"> • Low-maintenance, fail-safe operation due to compact design with integrated cable conduit • No cyclic maintenance 	<ul style="list-style-type: none"> • Low-maintenance, fail-safe operation due to compact design with integrated cable conduit • No cyclic maintenance

^{a)} act. = in operating state

Liquid Analyzers

- Water analysis (TOC) of waste water, drinking water, surface water, process water and much more
- Fluid analysis for process monitoring and control and for quality control and use in research



LIQUID ANALYZERS	TOCOR700	MCS300P
With thermal or UV reactor		Multi-component process analyzer, up to 6 components plus O ₂
Measuring principle	NDIR measurement after oxidation	Single-beam photometry Bifrequency and gas filter correlation
Measuring components	C _{org} (TOC)	IR, NIR, VIS absorbing liquids; suitable especially for measuring traces of water in organic liquids
Measuring task, application	Continuous, extractive water analysis for cumulative determination of carbon content from carbon compounds or elementary carbon Application in the chemical industry for analysis of process steam, surface water or raw sewage Monitoring for contamination in process water Monitoring of condensate in cooling circuits	In production plants in the chemical industry For monitoring the water concentration in EDC/VC in PVC production Measurement of isocyanate traces in chlorobenzene
Advantages	<ul style="list-style-type: none">• Longer service life of filters because carrier gas for CO₂ concentrations up to 300 ppm is generated and conditioned by TOCOR700• Can be equipped with sample point switching for up to 4 sample points• Standard in water measurement technology according to legal specifications• Very high measuring precision for small TOC concentrations	<ul style="list-style-type: none">• Special liquid cuvettes for corrosive, toxic liquids with integrated protection devices• Liquid pre-thermostat (option) and thermostatically controlled liquid cuvettes ensure very high measuring stability• A media pressure up to 870 PSI (60 bar) ensures high reliability even under difficult conditions
Compliances, regulations	ATEX, CE	CE, EMC 2004/108/EC, Low Voltage Directive 2006/95/EC
Measuring location		
Model	<ul style="list-style-type: none">• TOCOR700 TH with thermal reactor for use with unknown water compounds• TOCOR700 UV with UV reactor for use with known water compounds• Versions for use in ex zone 1 or ex zone 2• Version as stand-alone unit or wall-mounted unit	<ul style="list-style-type: none">• Compact process analyzer for easy wall fitting• Optional versions in analysis cabinet with integrated sample handling
Maintenance, repairs	<ul style="list-style-type: none">• Reduction of downtimes caused by maintenance from 12 hours to 15 minutes by use of two thermal reactors (option)• Very easy to maintain due to high absorption capacity for salts and solids	<ul style="list-style-type: none">• Low maintenance requirements• Automatic check cycle for zero and reference point monitoring• Adjusting filter wheel (option) for quick check



AUTOMOTIVE	FLAWSIC150 CARFLOW
Mobile, compact measuring system	
Measuring principle	Measurement of difference in ultrasonic transit time
Measuring components	Gas velocity, volume flow (act. ^{*)}), volume flow (std. ^{**}), gas temperature, absolute pressure, sound velocity
Measuring task, application	<p>Direct measurement of exhaust gas volume flow of roller test benches as well as test benches for diesel and gasoline engines in the automotive industry</p> <p>Direct, time-coupled emission assignment</p> <p>Measurement of undiluted exhaust gas, simultaneous gas analysis with very low pollutant concentrations possible</p>
Advantages	<ul style="list-style-type: none"> • No moving parts, no wear • High response speed (real-time measurement), optimization of engine and electronic components possible • Practically no pressure loss, no influence on engine characteristics • Single or multipath measurements for very high precision – also at low speeds
Measuring location	
Model	Mobile measuring system with compact measuring cell with embedded ultrasonic transducers and integrated operating unit
Maintenance, repairs	<ul style="list-style-type: none"> • Minimal maintenance requirements

^{*)} act. = in operating state;

^{**)} std. = in standard state

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Our Competence in the Business Segments

Factory Automation

With its intelligent sensors, safety systems, and auto idet applications, SICK offers comprehensive solutions for factory automation.



- Non-contact detecting, counting, classifying, and positioning of any type of object
- Accident protection and personal safety using sensors, as well as safety software and services

Logistics Automation

Sensors made by SICK form the basis for automating material flows and the optimization of sorting and warehousing processes.



- Automated identification with bar code and RFID reading devices for the purpose of sorting and target control in industrial material flow
- Detecting volume, position, and contours of objects and surroundings with laser measurement systems

Process Automation

Optimized system solutions from SICK ensure efficient acquisition of process and environmental data in many industrial processes.



- Precise measurement of gases, liquids and dust concentrations for continuous emissions monitoring and the acquisition of process data in production processes
- Gas flow measurements with maximum accuracy thanks to compact gas meters



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