



# MCS100E HW/PD/CD MULTICOMPONENT ANALYZER SYSTEMS

EMISSION AND RAW GAS MONITORING  
WITH HOT MEASUREMENT

CEMS Solution

**SICK**  
Sensor Intelligence.

# CONTINUOUS, EXTRACTIVE FLUE GAS MONITORING

On MCS100E HW, from sampling to the cell, all components that are in contact with the sample gas are heated to above dew point and thus protected from corrosion. On MCS100E CD/PD, gas drying is performed via a cooler/permeation dryer. The sample gas pump is located in the MCS100E system cabinet. Fast sample gas exchange minimizes adsorption or desorption effects, especially of HCl and NH<sub>3</sub>. In case of a malfunction, the system is purged with zero gas and thus protected from corrosion. During span gas feeding on the sampling probe, the complete extraction system is included in the calibration check.

## MCS100E HW – raw/clean gas monitoring

- System with high-temperature measuring technology
- Standard in emission monitoring according to official requirements
- Raw gas monitoring for process control – also with high acid dew point
- HCl, SO<sub>2</sub>, CO, NO, H<sub>2</sub>O, CO<sub>2</sub>, O<sub>2</sub> and also NO<sub>2</sub>, NH<sub>3</sub> and N<sub>2</sub>O
- C<sub>org</sub> with FID analyzer as an option
- Other IR active components on request

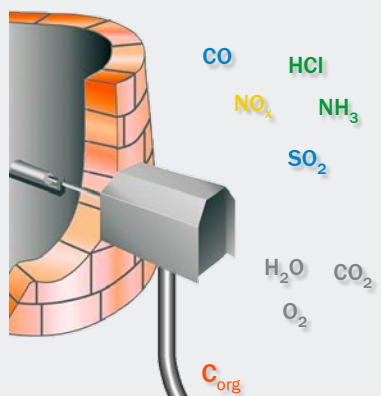
## MCS100E CD/PD – very small measuring ranges

- Monitoring of guaranteed values
- Very small measuring ranges, especially for SO<sub>2</sub>, NO, NO<sub>2</sub>
- MCS100E CD with gas cooler
- MCS100E PD with permeation dryer
- With MCS100E PD, also for HCl

## EN 14181 – without test gas

- QAL3 can also be performed with internal calibration filter – no test gas required
- On MCS100E HW this function is certified by TÜV
- Qualified, experienced support for official acceptance
- Support for QAL3, e.g. with CUSUM tables





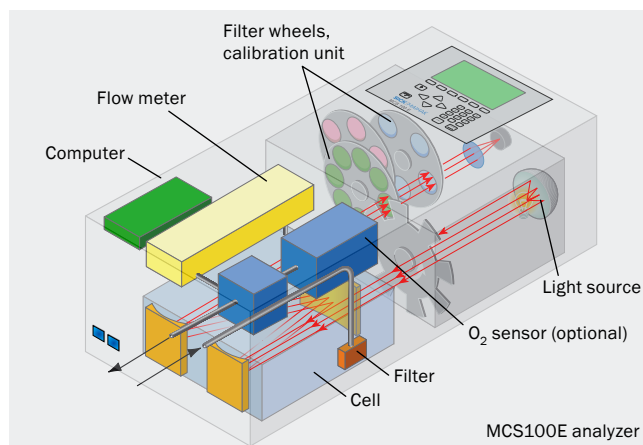
Heated sample gas line



MCS100E system cabinet

### Bifrequency and gas filter correlation principle

The single beam infrared filter photometer of the analyzer allows the simultaneous use of bifrequency and gas filter correlation methods. The cell is optimized for fast gas exchange and thermostatically controlled to high temperatures. A sintered metal protective filter is fitted in the sample gas inlet. An integrated flow meter triggers an alarm when the value is below the set limit value. Optionally, the analyzer can contain an oxygen measurement. The optional use of an internal calibration check allows fast checking of the measured values without test gas



MCS100E analyzer

# EMISSION AND RAW GAS MONITORING WITH HOT MEASUREMENT



## Product description

The MCS100E HW is an analyzer system for extractive measurement of up to 8 IR-active gas compounds. It can be supplemented with oxygen and total hydrocarbon analyzers. From probe sampling to cell, all components that are in

contact with the sample gas are heated above dew point and thus protected from corrosion. This hot measurement technique allows the measurement of water soluble components HCl and NH<sub>3</sub>.

## At a glance

- Extractive measurement of up to 8 IR-active gas compounds
- Additional oxygen and total hydrocarbon analyzers as an option
- Gas paths completely heated
- Test gas supply at the gas sampling probe or at the analyzer
- Back-purging of gas sampling probe for cleaning of filters
- Fast sample gas exchange for minimizing adsorption and desorption effects
- Automated sample point switching

## Your benefits

- Measurement of several gas components with one analyzer
- Heated gas paths enables measurement of difficult gases like HCl and NH<sub>3</sub>
- Long maintenance intervals (typically 6 months) due to self monitoring of the analyzer
- Selective measurement of NO and NO<sub>2</sub> – no converter required
- QAL3 drift test according to EN 14181 with internal calibration filter wheel – no test gas required



## Additional information

Fields of application . . . . .	5
Detailed technical data . . . . .	5
Ordering information . . . . .	7
Dimensional drawings . . . . .	7

→ [www.mysick.com/en/MCS100E\\_HW](http://www.mysick.com/en/MCS100E_HW)

For more information, just enter the link and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

## Fields of application

- Emission monitoring of waste incineration plants
- Monitoring of combustion plants with secondary fuels
- Flue gas monitoring in cement plants
- Emission monitoring of refineries
- Emission monitoring of heavy oil fired diesel engines

## Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

### MCS100E HW system

<b>Measured values</b>	CH <sub>4</sub> , CO, CO <sub>2</sub> , H <sub>2</sub> O, HCl, N <sub>2</sub> O, NH <sub>3</sub> , NO, NO <sub>2</sub> , O <sub>2</sub> , SO <sub>2</sub>	
<b>Performance tested measurands</b>	CO, CO <sub>2</sub> , H <sub>2</sub> O, HCl, NH <sub>3</sub> , NO, O <sub>2</sub> , SO <sub>2</sub>	
<b>Measurement principles</b>	Interference filter correlation, Gas filter correlation, Zirconium dioxide sensor	
<b>Sample quantity</b>	200 l/h ... 1,000 l/h Depending on application	
<b>Measuring ranges</b>		
	CH <sub>4</sub>	0 ... 70 ppm / 0 ... 1,400 ppm
	CO	0 ... 60 ppm / 0 ... 2,000 ppm
	CO <sub>2</sub>	0 ... 25 Vol.-% / 0 ... 100 Vol.-%
	H <sub>2</sub> O	0 ... 1 Vol.-% / 0 ... 40 Vol.-%
	HCl	0 ... 10 ppm / 0 ... 1,900 ppm
	NH <sub>3</sub>	0 ... 30 ppm / 0 ... 660 ppm
	NO	0 ... 150 ppm / 0 ... 1,900 ppm
	NO <sub>2</sub>	0 ... 50 ppm / 0 ... 500 ppm
	N <sub>2</sub> O	0 ... 50 ppm / 0 ... 1,000 ppm
	O <sub>2</sub>	0 ... 1 Vol.-% / 0 ... 21 Vol.-%
	SO <sub>2</sub>	0 ... 25 ppm / 0 ... 5,000 ppm
		Other measuring ranges on request
<b>Certified measuring ranges</b>		
	CO	0 ... 75 mg/m <sup>3</sup>
	CO <sub>2</sub>	0 ... 20 Vol.-%
	H <sub>2</sub> O	0 ... 40 Vol.-%
	HCl	0 ... 15 mg/m <sup>3</sup>
	NH <sub>3</sub>	0 ... 20 mg/m <sup>3</sup>
	NO	0 ... 200 mg/m <sup>3</sup>
	O <sub>2</sub>	0 ... 21 Vol.-%
	SO <sub>2</sub>	0 ... 75 mg/m <sup>3</sup>
<b>Response time</b>	≤ 200 s Depending on application	
<b>Process temperature</b>	0 °C ... +1,300 °C	
<b>Sample temperature</b>	Inlet analyzer system: 0 °C ... +220 °C	
<b>Process pressure</b>	900 hPa ... 1,100 hPa Atmospheric	
<b>Ambient temperature</b>	+5 °C ... +35 °C With cooling device: +5 °C ... +50 °C	
<b>Ambient pressure</b>	900 hPa ... 1,100 hPa	

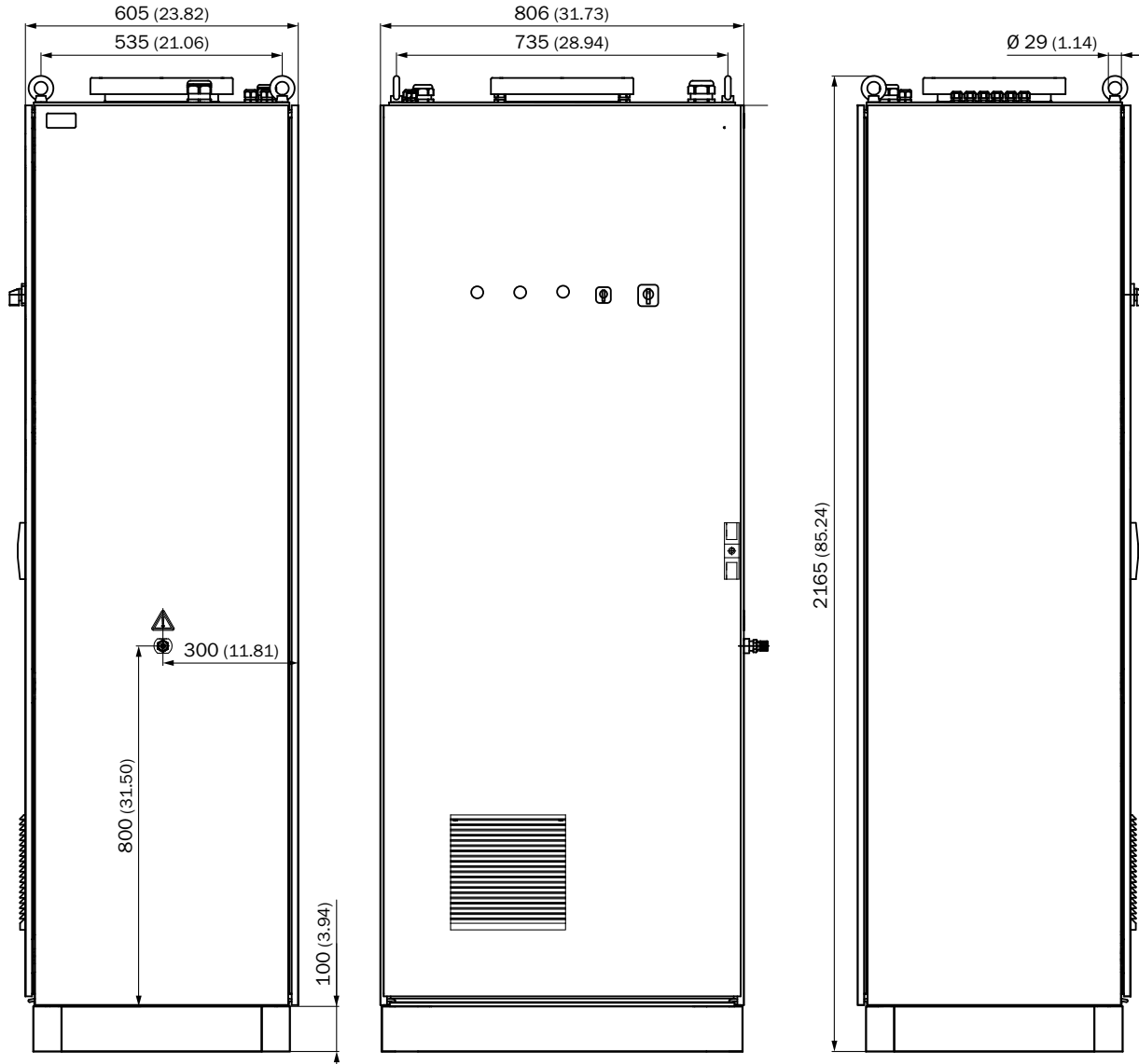
<b>Conformities</b>	<p>Approved for plants requiring approval</p> <p>2001/80/EC</p> <p>2000/76/EC</p> <p>MCERTS</p> <p>EN 15267</p> <p>EN 14181</p> <p>GOST</p> <p>U.S. EPA compliant</p>
<b>Electrical safety</b>	CE
<b>Enclosure rating</b>	IP 43
<b>Analog outputs</b>	<p>4 outputs:</p> <p>0/4 ... 20 mA, 500 <math>\Omega</math></p> <p>Max. 64 outputs with opto box via optical fibre possible</p>
<b>Analog inputs</b>	<p>4 inputs:</p> <p>0/4 ... 20 mA</p> <p>Max. 64 inputs with opto box via optical fibre possible</p>
<b>Digital outputs</b>	<p>12 outputs:</p> <p>40 V, 1 A</p> <p>Max. 64 outputs with opto box via optical fibre possible</p>
<b>Digital inputs</b>	<p>4 inputs:</p> <p>50 V AC, 4 A / 24 V DC, 4 A</p> <p>Max. 64 inputs with opto box via optical fibre possible</p>
<b>Interfaces</b>	<p>RS-232</p> <p>RS-485</p> <p>Modem</p> <p>Additional interfaces on request</p>
<b>Bus protocol</b>	<p>MODBUS</p> <p>Additional buses on request</p>
<b>Operation</b>	<p>Via integrated operating unit</p> <p>Two operating levels, one password-protected</p> <p>Sequence programs can be programmed as required</p>
<b>Test functions</b>	<p>Automatic control cycle for zero and span point</p> <p>Internal calibration filter for QAL3 drift check without test gas (option)</p>
<b>Options</b>	<p>Zirconium dioxide sensor (oxygen measurement)</p> <p>Total hydrocarbon analyzer</p>

## Ordering information

Our regional sales organization will help you to select the optimum device configuration.

## Dimensional drawings (Dimensions in mm (inch))

### MCS100E HW



# EMISSION MONITORING OF VERY SMALL MEASURING RANGES INCLUDING HCL



### Product description

The MCS100E PD is an analyzer system for extractive measurement of up to 8 IR-active gas compounds. It can be supplemented with an oxygen sensor.

The gas is dried by a permeation dryer, whereby HCl remains in the gas. Very small measuring ranges are possible, especially for SO<sub>2</sub>, NO, NO<sub>2</sub> and HCl.

### At a glance

- Extractive measurement of up to 8 IR-active gas compounds
- Additional oxygen sensor as an option
- Integrated permeation dryer
- Test gas supply at the gas sampling probe or at the analyzer
- Back-flushing of gas sampling probe for cleaning of filters
- Fast sample gas exchange for minimizing adsorption and desorption effects
- Automated sample point switching

### Your benefits

- Especially low measurement ranges for SO<sub>2</sub>, NO, NO<sub>2</sub> and HCl
- Selective measurement of NO and NO<sub>2</sub> – no converter required
- Measurement of several gas components with one analyzer
- Long maintenance intervals (typically 6 months) due to self monitoring of the analyzer



### Additional information

Fields of application . . . . . 9

Detailed technical data . . . . . 9

Ordering information . . . . . 11

Dimensional drawings . . . . . 11

→ [www.mysick.com/en/MCS100E\\_PD](http://www.mysick.com/en/MCS100E_PD)

For more information, just enter the link and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.



## Fields of application

- Flue gas monitoring in waste incineration plants
- Emission monitoring in refineries
- Clean gas monitoring in industrial plants

## Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

### MCS100E PD system

<b>Measured values</b>	CH <sub>4</sub> , CO, CO <sub>2</sub> , H <sub>2</sub> O, HCl, N <sub>2</sub> O, NO, NO <sub>2</sub> , O <sub>2</sub> , SO <sub>2</sub>	
<b>Performance tested measurands</b>	CO, CO <sub>2</sub> , HCl, NO, NO <sub>2</sub> , O <sub>2</sub> , SO <sub>2</sub>	
<b>Measurement principles</b>	Interference filter correlation, Gas filter correlation, Zirconium dioxide sensor	
<b>Sample quantity</b>	200 l/h ... 1,000 l/h Depending on application	
<b>Measuring ranges</b>		
	CH <sub>4</sub>	0 ... 140 ppm / 0 ... 1,400 ppm
	CO	0 ... 40 ppm / 0 ... 2,000 ppm
	CO <sub>2</sub>	0 ... 25 Vol.-% / 0 ... 100 Vol.-%
	H <sub>2</sub> O	0 ... 1 Vol.-% / 0 ... 5 Vol.-%
	HCl	0 ... 6 ppm / 0 ... 1,900 ppm
	NO	0 ... 40 ppm / 0 ... 1,900 ppm
	NO <sub>2</sub>	0 ... 40 ppm / 0 ... 500 ppm
	N <sub>2</sub> O	0 ... 50 ppm / 0 ... 1,000 ppm
	O <sub>2</sub>	0 ... 1 Vol.-% / 0 ... 21 Vol.-%
	SO <sub>2</sub>	0 ... 4 ppm / 0 ... 5,000 ppm
		Other measuring ranges on request
<b>Certified measuring ranges</b>		
	CO	0 ... 50 mg/m <sup>3</sup>
	CO <sub>2</sub>	0 ... 25 Vol.-%
	HCl	0 ... 10 mg/m <sup>3</sup>
	NO	0 ... 50 mg/m <sup>3</sup>
	NO <sub>2</sub>	0 ... 80 mg/m <sup>3</sup>
	O <sub>2</sub>	0 ... 21 Vol.-%
	SO <sub>2</sub>	0 ... 10 mg/m <sup>3</sup>
<b>Response time</b>	≤ 200 s Depending on application	
<b>Process temperature</b>	0 °C ... +1,300 °C	
<b>Sample temperature</b>	Inlet analyzer system: 0 °C ... +220 °C	
<b>Process pressure</b>	900 hPa ... 1,100 hPa Atmospheric	
<b>Ambient temperature</b>	+5 °C ... +35 °C With cooling device: +5 °C ... +50 °C	
<b>Ambient pressure</b>	900 hPa ... 1,100 hPa	
<b>Conformities</b>	Approved for plants requiring approval 2001/80/EC 2000/76/EC MCERTS EN 15267 EN 14181 GOST U.S. EPA compliant	
<b>Electrical safety</b>	CE	

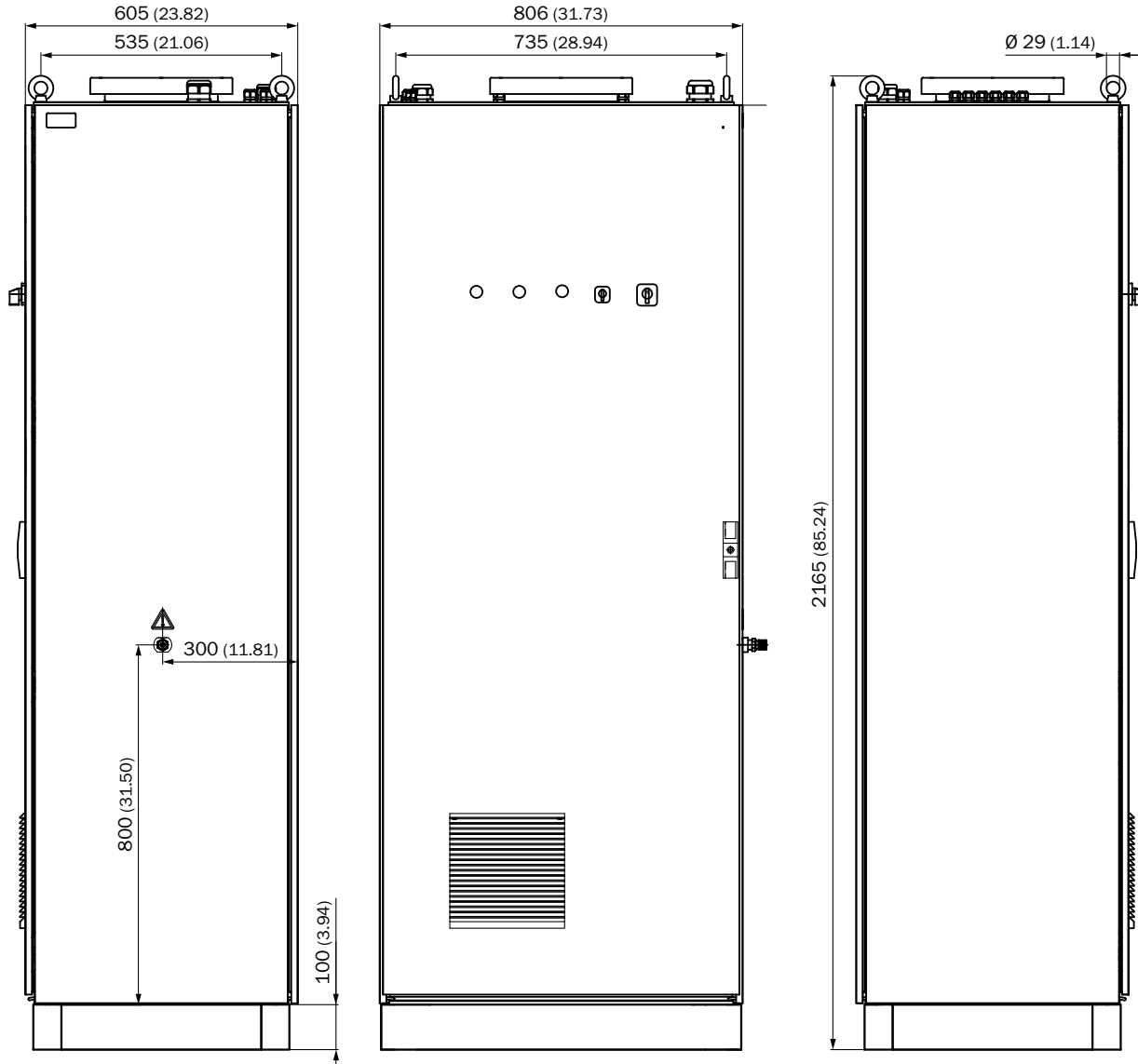
<b>Enclosure rating</b>	IP 43
<b>Analog outputs</b>	4 outputs: 0/4 ... 20 mA, 500 $\Omega$ Max. 64 outputs with opto box via optical fibre possible
<b>Analog inputs</b>	4 inputs: 0/4 ... 20 mA Max. 64 inputs with opto box via optical fibre possible
<b>Digital outputs</b>	12 outputs: 40 V, 1 A Max. 64 outputs with opto box via optical fibre possible
<b>Digital inputs</b>	4 inputs: 50 V AC, 4 A / 24 V DC, 4 A Max. 64 inputs with opto box via optical fibre possible
<b>Interfaces</b>	RS-232 RS-485 Modem Additional interfaces on request
<b>Bus protocol</b>	MODBUS Additional buses on request
<b>Operation</b>	Via integrated operating unit Two operating levels, one password-protected Sequence programs can be programmed as required
<b>Test functions</b>	Automatic control cycle for zero and span point Internal calibration filter for QAL3 drift check without test gas (option)
<b>Options</b>	Zirconium dioxide sensor (oxygen measurement) Total hydrocarbon analyzer

## Ordering information

Our regional sales organization will help you to select the optimum device configuration.

## Dimensional drawings (Dimensions in mm (inch))

MCS100E PD



# EMISSION MONITORING OF VERY SMALL MEASURING RANGES



### Product description

The MCS100E CD is an analyzer system for extractive measurement of up to 8 IR-active gas compounds. It can be supplemented with an oxygen sensor.

The gas is dried by an integrated gas cooler allowing measurement of very small measuring ranges, especially for SO<sub>2</sub>, NO and NO<sub>2</sub>.

### At a glance

- Extractive measurement of up to 8 IR-active gas compounds
- Optional oxygen sensor available
- Integrated gas cooler
- Test gas supply at the gas sampling probe or at the analyzer
- Back-purging of gas sampling probe for cleaning of filters
- Fast sample gas exchange for minimizing adsorption and desorption effects
- Automated sample point switching

### Your benefits

- Especially low measurement ranges for SO<sub>2</sub>, NO, NO<sub>2</sub>
- Selective measurement of NO and NO<sub>2</sub> – no converter required
- Measurement of several gas components with one analyzer



### Additional information

Fields of application . . . . . 13

Detailed technical data . . . . . 13

Ordering information . . . . . 14

Dimensional drawings . . . . . 14

→ [www.mysick.com/en/MCS100E\\_CD](http://www.mysick.com/en/MCS100E_CD)

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## Fields of application

- Flue gas monitoring in power stations
- Monitoring of combustion plants
- Emission monitoring in industrial plants

## Detailed technical data

The exact device specifications and performance data of the product may deviate from the information provided here, and depend on the application in which the product is being used and the relevant customer specifications.

### MCS100E CD system

<b>Measured values</b>	CH <sub>4</sub> , CO, CO <sub>2</sub> , H <sub>2</sub> O, NO, NO <sub>2</sub> , N <sub>2</sub> O, O <sub>2</sub> , SO <sub>2</sub>
<b>Measurement principles</b>	Interference filter correlation, Gas filter correlation, Zirconium dioxide sensor
<b>Sample quantity</b>	200 l/h ... 1,000 l/h Depending on application
<b>Measuring ranges</b>	CH <sub>4</sub> 0 ... 140 ppm / 0 ... 1,400 ppm CO 0 ... 40 ppm / 0 ... 2,000 ppm CO <sub>2</sub> 0 ... 25 Vol.-% / 0 ... 100 Vol.-% H <sub>2</sub> O 0 ... 1 Vol.-% / 0 ... 5 Vol.-% NO 0 ... 40 ppm / 0 ... 1,900 ppm NO <sub>2</sub> 0 ... 40 ppm / 0 ... 500 ppm N <sub>2</sub> O 0 ... 50 ppm / 0 ... 1,000 ppm O <sub>2</sub> 0 ... 1 Vol.-% / 0 ... 21 Vol.-% SO <sub>2</sub> 0 ... 4 ppm / 0 ... 5,000 ppm
<b>Dual measuring ranges</b>	Other measuring ranges on request
<b>Response time</b>	≤ 200 s Depending on application
<b>Process temperature</b>	0 °C ... +1,300 °C
<b>Sample temperature</b>	Inlet analyzer system: 0 °C ... +220 °C
<b>Process pressure</b>	900 hPa ... 1,100 hPa Atmospheric
<b>Ambient temperature</b>	+5 °C ... +35 °C With cooling device: +5 °C ... +50 °C
<b>Ambient pressure</b>	900 hPa ... 1,100 hPa
<b>Conformities</b>	MCERTS GOST
<b>Electrical safety</b>	CE
<b>Enclosure rating</b>	IP 43
<b>Analog outputs</b>	4 outputs: 0/4 ... 20 mA, 500 Ω Max. 64 outputs with opto box via optical fibre possible
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<b>Interfaces</b>	RS-232 RS-485 Modem Additional interfaces on request

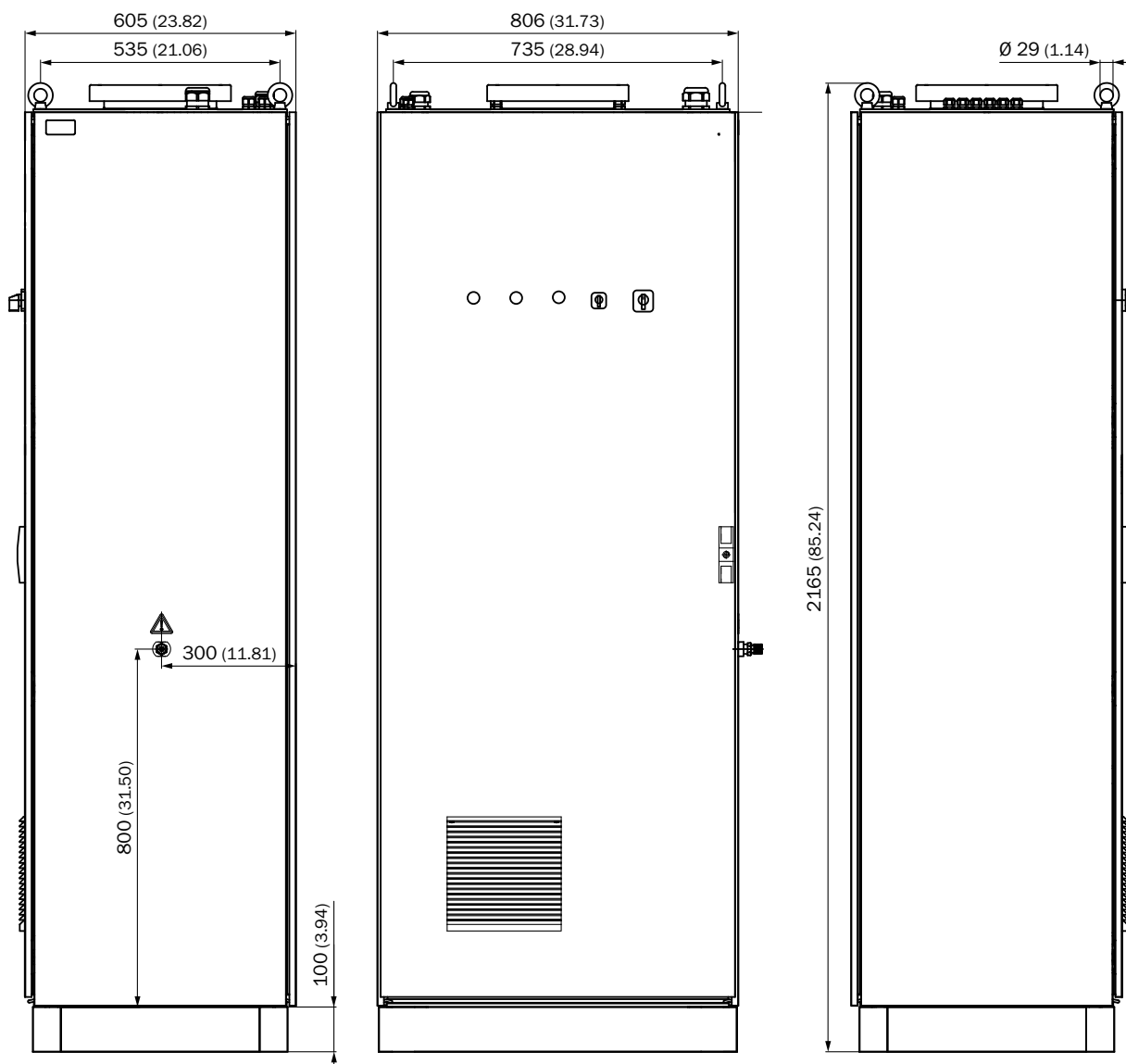
<b>Bus protocol</b>	MODBUS Additional buses on request
<b>Operation</b>	Via integrated operating unit Two operating levels, one password-protected Sequence programs can be programmed as required
<b>Test functions</b>	Automatic control cycle for zero and span point Internal calibration filter for QAL3 drift check without test gas (option)
<b>Options</b>	Zirconium dioxide sensor (oxygen measurement) Total hydrocarbon analyzer

## Ordering information

Our regional sales organization will help you to select the optimum device configuration.

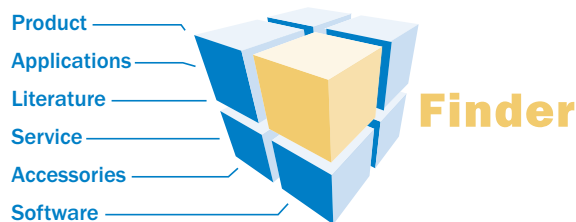
## Dimensional drawings (Dimensions in mm (inch))

MCS100E CD



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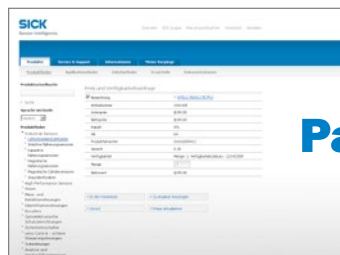


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Uncovers new potential for machines and systems



### Training & Education

Employee qualification for increased competitiveness

## SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for factory, logistics, and process automation. With more than 6,000 employees and over 40 subsidiaries worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services round out our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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Australia, Austria, Belgium/Luxembourg, Brazil, Czech Republic, Canada, China, Denmark, Finland, France, Germany, Great Britain, Hungary, India, Israel, Italy, Japan, Mexico, Netherlands, Norway, Poland, Romania, Russia, Singapore, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, United Arab Emirates, USA

Please find detailed addresses and additional representatives and agencies in all major industrial nations at: [www.sick.com](http://www.sick.com)