MCS200HW

Proven measuring technology for flue gas monitoring

Ready for current and future emission regulations

- Reliable measuring results – even for water-soluble gas components
- Only one analyzer necessary for simultaneous monitoring of up to 12 gas components
- Measurement components can be configured and extended flexibly
- Convenient, task-oriented operation
- Remote access without additional software
- High availability due to certified internal reference point drift monitoring (QAL3) without test gases
- Low service costs thanks to minimal maintenance requirements
- Data transmission through only one interface possible
- Use in explosion-hazardous areas thanks to rugged, pressurized enclosure

Endress+Hauser
People for Process Automation

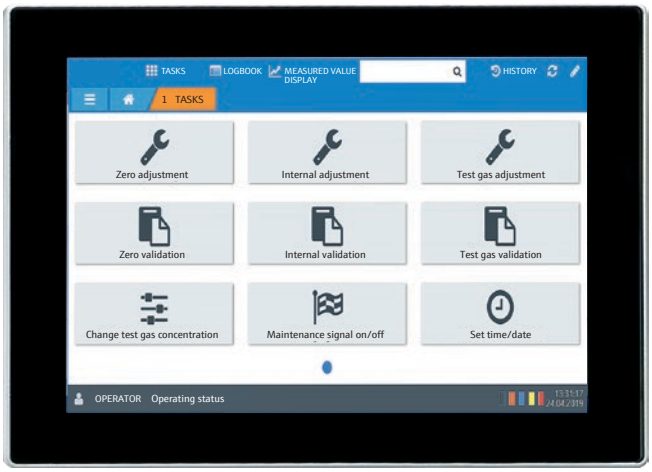
MCS200HW: Standard version
Ready for more stringent flue gas monitoring

Strict legal limits apply to the flue gas emissions of industrial plants with combustion processes. With the MCS200HW analyzer system, emissions can be continuously monitored – accurately and very reliably. The MCS200HW simultaneously measures up to 10 infrared-active gas components such as SO_2, NO, NO_2, CO, CO_2, NH_3, N_2O, H_2O, HCl, CH_4 as well as O_2 and can be configured for customer-specific measuring tasks.

The state-of-the-art MCS200HW is easy to install, user-friendly, and requires only minimal maintenance, making it a highly cost-effective solution. The analyzer system is designed for industrial applications and has a clear modular structure. It can be easily extended with an FID measurement module (GMS811 FIDORi) for measuring total carbon concentrations.

Easy access to the device and secure data access

The 12" touch display on the front side of the analyzer cabinet provides a task-based interface for operating the entire MCS200HW analyzer system. The web-based operating concept enables device and location independent access – conveniently and securely – via a web browser. No installation of specific software is required.



Secure data transmission via standardized Modbus® interface

The MCS200HW is certified according to the VDI 4201 standard, enabling seamless data transmission via a digital Modbus® interface. This significantly reduces installation and integration effort, as no special hardware such as analog or digital modules is required for communication with the device.

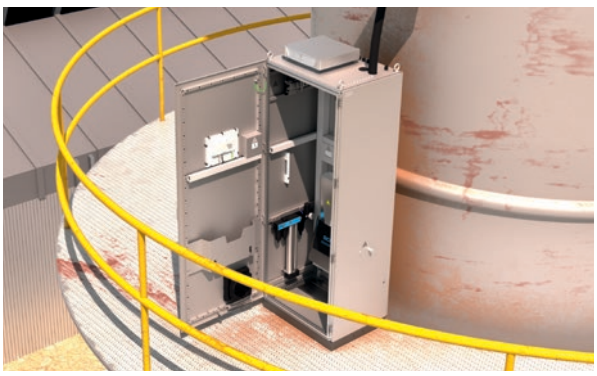
Emission measurement in your plant

Legal environmental regulations require the continuous monitoring of numerous pollutants and reference values in the exhaust gases of industrial plants. The MCS200HW can continuously measure, at a heated extractive sample point, gas components such as: HCl, CO, NO_x as the sum of NO and NO_2, SO_2, NH_3, O_2, H_2O, CO_2 and TOC/C_{ges}. For normalization, the pressure and temperature parameters are also recorded. The QAL3 thorough check can be carried out without test gas with the certified, integrated calibration filter.

Monitoring of gas compositions

In industrial plants such as metal and steel works that optimize the combustion system of the finishing furnaces, it is possible to improve the furnace performance and thereby achieve long-term savings for the plant operator.

The MCS200HW does so by efficiently and very reliably measuring flue gases such as CO, CO_2, H_2O, NO, NO_2, O_2 and SO_2 at the gas outlet of the furnace.



MCS200HW: Ex-version
Reliable emission measurement – including in explosion-hazardous areas

In industries with explosion-hazardous areas, a single spark can be disastrous. To meet the stringent requirements on explosion protection, analyzers and measuring devices must be especially rugged and reliable. The MCS200HW Ex is equipped with a pressurized enclosure for explosion-protection zones according to ATEX Zone 2 IIC T3. The touch display on the front side of the analyzer system – incorporated in the pressurized system – provides direct access to important functions and settings. And the SOPAS operating software provides a high level of transparency through convenient access from anywhere in your network.

Rugged for harsh Ex conditions:

- Classification for ATEX Zone 2 IIC T3
- Standardized measuring technology for economical CEMS solutions
- Simple and time-saving operation via innovative 12" touch display
- Consistent operating software with access from anywhere within the connected network

Emission measurements in petrochemical plants and refineries

Central supply equipment in any chemical plant includes boilers, furnaces and combustion systems. The amount and type of gas component emitted are regulated by local authorities in the form of environmental regulations and limit values. That is why O_2, NO_x, CO, SO_2, NH_3, CH_4, HCl and other substances often need to be continuously monitored. The appropriate analyzer solution is dependent on the type of fuel and the combustion process.

Emission measurement in your plant

Hazardous zones in industries and plants are reclassified on a regular basis. MCS200HW Ex is a rugged and reliable solution with an industry tested and proven measurement technology in a pressurized enclosure version that meets ATEX Zone 2 requirements.

One analyzer system, many possibilities, high efficiency

Long service life and high measurement certainty

The MCS200HW works according to the measurement principle of an infrared single-beam photometer. Both interference and gas filter correlation methods are used. All parts in contact with the sample gas are heated above the dew point in order to prevent condensate formation in the analyzer system and to avoid damage due to corrosion. Thus, water-soluble gases such as HCl or NH_3 can be monitored and are not lost through salt formation.

Reliable and cost-effective with very high measurement quality

Thanks to internal adjustment filters, drift checking and adjustment are possible even without a test gas. The reference point of all infrared-active components can be checked both manually and fully automatically. The reference point check can also be used for quality assurance during operation (QAL3 inspection). Expensive test gases are not necessary and the workload is reduced.

Low maintenance and effective: wear-free gas pumping

An ejector pump conveys the measurement gas from the gas sampling unit of the analyzer system. The device operates without wear and tear: the gas is moved in the system by negative pressure without mechanical stress on the components. Maintenance is minimized, which at the same time reduces running costs.

Tailored configuration for flexibility and efficiency

The analyzer system can be individually configured depending on the measuring task. The costs are based on the respective measuring components used. The result: tailored analyzer system – highly economical and high-performing.

Lower costs due to the use of dry test gases

With the MCS200HW, reference point checking and adjustment of HCl and NH_3 are possible for the first time using exclusively dry test gases certified according to EN 15267 and EN 14181. Test gas generators or evaporators for generating wet test gases are no longer required. This saves time and reduces operating costs. Both for operating entities, e.g. when carrying out the regular QAL3 inspections, and for test institutes, e.g. when carrying out the annual surveillance test (AST).

Condition monitoring included

INDUSTRY 4.0 READY

The powerful duo doubles the efficiency and fail safety

As the first multi-component analyzer system, the MCS200HW is already connected to the Monitoring Box and Condition Monitoring services ex works. This gives you the ability to visualize and evaluate the condition data of your plants and sensors at any time and from any location.

Benefit for you

You can immediately start deploying your maintenance staff only when maintenance is actually required and also reduce downtimes to a minimum. And because it is so important, in particular in flue gas systems, that the gas analysis functions properly, the Monitoring Box supports you in complying with strict emission limits.

Thanks to integrated Monitoring Box: effectively plan your service deployments.

With the Monitoring Box, you obtain virtual access to sensors and plants and can continuously optimize them during operation. The Monitoring Box digitally monitors all integrated devices of your company and detects any changes in the condition of sensors and plants in real time. Faults can thereby be detected early or avoided altogether. The Monitoring Box not only supports predictive maintenance. It also makes it easier to prepare for service deployments so our service technicians can be on-site in time and with the right spare parts.

Step by step to more efficiency

Smart Service Gateway

Monitoring app

Internet connection

Condition Monitoring

The sensors are connected to a Smart Service Gateway via standard interfaces. The data is collected and pre-processed in the gateway.

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Data analysis and trend forecasting

Diagrams present measurement data and the status of all devices in a clear and understandable way within the dashboard. This allows the data to be quickly analyzed and trends identified.

High plant availability

Analysis of condition data reduces unplanned downtimes and keeps the plant running smoothly.

Quick response

Automatic alerts in e-mails or text messages enable timely action when anomalies or deviations are detected. Solutions and recommended actions are displayed in direct form

Predictive maintenance

Verification and evaluation of historical data make it possible to schedule maintenance work and optimize the lifetime of spare and wear parts. This saves time and money.

MCS200HW: Proven measurement technology for flue gas monitoring

Product Description

The MCS200HW is a multi-component analyzer system for continuous monitoring of up to 10 IR measurement components in flue gases of industrial combustion plants. The MCS200HW operates using a hot-extractive method: all wetted parts, from the gas sampling probe to the cuvette, are heated above the dew point and thus protected from corrosion. The internal reference point check enables a quick verification of measured values without test gases. The web display and task assistants integrated in the software make operation very easy. The MCS200HW Ex also provides reliable emission measurement in hazardous areas.

At a glance

- Measurement of up to 10 IR components plus O_2 and TOC
- Hot/wet extractive measurement technology
- Wear-free gas distribution through ejector pumps
- Reference point monitoring with internal calibration cells
- Certified digital Modbus® interface
- Web server for platform-independent device control
- Use of dry test gases for HCl and NH3
- Classification for ATEX Zone 2 IIC T3

Your benefits

- Reliable measurement results, even for water-soluble gas components
- Only one analyzer necessary for simultaneous monitoring of up to 12 gas components
- Measurement components can be configured and extended flexibly
- Convenient, task-oriented operation
- Remote access without additional software
- High availability due to certified internal reference point drift monitoring (QAL3) without test gases
- Low service costs thanks to minimal maintenance requirements
- Data transmission through only one interface possible
- Use in explosion-hazardous areas thanks to rugged, pressurized enclosure

Fields of application

- Emission monitoring for waste incineration plants as well as power plants and plants with co-incineration, e.g. cement plants
- Measurement of nitrogen oxides (NO, NO_2, N_2O) in nitric acid plants

More Information online

For more information, enter the link or scan the QR code to get direct access to technical data, operating instructions, software, application examples, and much more.
www.endress.com/mcs200hw

Technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

MCS200HW: standard version

Measured values	CH_4, CO, CO_2, C_{org}, HCl, H_2O, NH_3, NO, NO_2, N_2O, O_2, SO_2
Performance-tested measurand	CH_4, CO, CO_2, C_{org}, HCl, H_2O, NH_3, NO, NO_2, N_2O, O_2, SO_2
Measurement principles	interference filter correlation, gas filter correlation
Measuring distance	8.48 m
Gas flow rate	200 l/h to 400 l/h
Measuring ranges	
CH_4	0 to 70 ppm / 0 to 700 ppm
CO	0 to 60 ppm / 0 to 8,000 ppm
CO_2	0 to 25 Vol.-% / 0 to 50 Vol.-%
C_{org}	0 to 15 mg/m³ / 0 to 10,000 mg/m³
HCl	0 to 9 ppm / 0 to 1,840 ppm
H_2O	0 to 40 Vol.-%
NH_3	0 to 15 ppm / 0 to 650 ppm
NO	0 to 110 ppm / 0 to 1,865 ppm
NO_2	0 to 25 ppm / 0 to 240 ppm
N_2O	0 to 50 ppm / 0 to 1,015 ppm
O_2	0 to 25 Vol.-%
SO_2	0 to 26 ppm / 0 to 875 ppm
Certified measuring ranges	
CH_4	0 to 50 mg/m³ / 0 to 500 mg/m³
CO	0 to 75 mg/m³ / 0 to 10,000 mg/m³
CO_2	0 to 25% by vol.
C_{org}	0 to 15 mg/m³ / 0 to 50 mg/m³ / 0 to 150 mg/m³ / 0 to 500 mg/m³
HCl	0 to 15 mg/m³ / 0 to 3,000 mg/m³
H_2O	0 to 40% by vol.
NH_3	0 to 10 mg/m³ / 0 to 500 mg/m³
NO	0 to 150 mg/m³ / 0 to 2,500 mg/m³
NO_2	0 to 50 mg/m³ / 0 to 500 mg/m³
N_2O	0 to 100 mg/m³ / 0 to 2,000 mg/m³
O_2	0 to 25% by vol.
SO_2	0 to 75 mg/m³ / 0 to 2,500 mg/m³
Response time (t_{90})	≤ 200 s
Accuracy	≤ 2% relative to measuring range limit value

Sensitivity drift	≤ 3%: within the maintenance interval, relative to the measuring range limit value
Zero point drift	< 3% of the measuring range limit value per maintenance interval
Reference point drift	< 3% of the measuring range limit value per maintenance interval
Detection limit	≤ 2%: relative to measuring range limit value
TOC measurement	0.05 mg/m³
Reproducibility	≤ 3.3% relative to measuring range limit value
O_2 measurement	≤ 0.2% by vol.
Uncertainty of measurement	≤ 2% of the measuring range limit value
Process temperature	≤ +550 °C
Sample gas temperatur	
Input analyzer system:	≤ +200 °C
Process pressure	850 hPa to 1,100 hPa
Process gas humidity	≤ 40% by vol.
Ambient temperature	+5 °C to +40 °C
with A/C unit:	+5 °C to +50 °C
Storage temperature	–20 °C to +70 °C
Ambient pressure	850 hPa to 1,100 hPa
Ambient humidity	≤ 90% relative humidity; non-condensing
Conformities	Approved for systems requiring a permit: 2000/76 / EG (17th German Federal Immission Control Act (BImSchV)) 2001/80 / EC (13th German Federal Immission Control Act (BImSchV)) 27th German Federal Immission Control Act (BImSchV) EN 15267 EN 14181
Electrical safety	CE
Enclosure rating	IP54
Analog outputs	0/4 to 20 mA, 500 Ω; number depends on system configuration
Analog inputs	0/4 to 20 mA, 100 Ω; number depends on system configuration; electrically isolated
Digital outputs	48 V AC, 0.5 A, 35 W / 48 V DC, 0.5 A, 24 W; number depends on system configuration; electrically isolated
Digital inputs	3.9 V, 4.5 mA, 0.55 W; number depends on system configuration
Modbus	✔
Type of fieldbus integration	TCP RTU RS-485
PROFIBUS DP	✔
Note	Option
PROFINET	✔
Note	Option
Ethernet	✔
Function	Connection to SOPAS ET software or OPC server
Indication	LC display, status LEDs
Input	Touchscreen

Operation	Via LC display or SOPAS ET software, multiple operating levels, password-protected
Menu language	German, English
Dimensions (W x H x D)	
Analyzer cabinet	808 mm x 2.208 mm x 623 mm (details see dimensional drawings)
Mounting plate	699 mm x 1.896 mm x 334 mm (details see dimensional drawing)
Weight	
Analyzer cabinet	approx. 250 kg
Material system cabinet	Paintet steel Option: stainless steel, GRP
Power supply	
Voltage	115 V AC, ± 10% 230 V AC, ± 10%
Frequency	50 Hz / 60 Hz
Power consumption	Analyzer: ≤ 1,000 VA Sample gas line, heated: ≤ 95 VA/m Gas sampling unit: ≤ 450 VA Heated gas sampling pipe: ≤ 200 VA to ≤ 600 VA
Auxiliaries	
Instrument air (zero gas quality):	≤ 350 l/h, 6 to 7 bar; particle size max. 1 µm; oil content max. 0.1 mg/m³; pressure condensation point max. −40 °C, purity class 2 (ISO 8573)
Instrument air (propellant air for ejector):	≤ 1,300 l/h, 5 to 7 bar; particle size max. 5 µm; oil content max. 1 mg/m³; pressure condensation point max. +3 °C, purity class 3 (ISO 8573)
Reference gas:	≤ 350 l/h, max. 4 bar; the reference gas must comply with the requirements of the applicable standards and guidelines
Sample connections	
Measuring gas input	Tube fitting connection for 6 mm pipes
Auxiliary connections	
Propellant air for ejector	DN 6/8
Reference gas	Tube fitting connection for 6 mm pipes
Exhaust gas outlet	DN 8/10
Corrective functions	Drift correction and optical monitoring function via adjustment cell
Test functions	Automatic check cycle for zero and reference point
System components	Gas sampling unit Sample gas line Analyzer cabinet
Options	GMS811 FIDORi

MCS200HW Ex system

Measured values	CH_4, CO, CO_2, HCl, H_2O, NH_3, NO, NO_2, N_2O, O_2, SO_2
Performance-tested measurand	CH_4, CO, CO_2, HCl, H_2O, NH_3, NO, NO_2, N_2O, O_2, SO_2
Measurement principles	interference filter correlation, gas filter correlation
Measuring distance	8.48 m
Gas flow rate	200 l/h to 400 l/h
Measuring ranges	
CH_4	0 to 70 ppm / 0 to 700 ppm
CO	0 to 60 ppm / 0 to 8,000 ppm
CO_2	0 to 25 Vol.-% / 0 to 50 Vol.-%
HCl	0 to 9 ppm / 0 to 1,840 ppm
H_2O	0 to 40 Vol.-%
NH_3	0 to 15 ppm / 0 to 650 ppm
NO	0 to 110 ppm / 0 to 1,865 ppm
NO_2	0 to 25 ppm / 0 to 240 ppm
N_2O	0 to 50 ppm / 0 to 1,015 ppm
O_2	0 to 25 Vol.-%
SO_2	0 to 26 ppm / 0 to 875 ppm
Certified measuring ranges	
CH_4	0 to 50 mg/m³ / 0 to 500 mg/m³
CO	0 to 75 mg/m³ / 0 to 10,000 mg/m³
CO_2	0 to 25% by vol.
HCl	0 to 15 mg/m³ / 0 to 3,000 mg/m³
H_2O	0 to 40% by vol.
NH_3	0 to 10 mg/m³ / 0 to 500 mg/m³
NO	0 to 150 mg/m³ / 0 to 2,500 mg/m³
NO_2	0 to 50 mg/m³ / 0 to 500 mg/m³
N_2O	0 to 100 mg/m³ / 0 to 2,000 mg/m³
O_2	0 to 25% by vol.
SO_2	0 to 75 mg/m³ / 0 to 2,500 mg/m³
Response time (t_{90})	≤ 200 s
Accuracy	≤ 2% relative to measuring range limit value
Sensitivity drift	≤ 3%: within the maintenance interval, relative to the measuring range limit value
Zero point drift	< 3% of the measuring range limit value per maintenance interval
Reference point drift	< 3% of the measuring range limit value per maintenance interval
Detection limit	≤ 2%: relative to measuring range limit value

Reproducibility	≤ 3.3% relative to measuring range limit value
O_2 measurement	≤ 0.2% by vol.
Uncertainty of measurement	≤ 2% of the measuring range limit value
Process temperature	≤ +550 °C
Sample gas temperatur	
Input analyzer system:	≤ +200 °C
Process pressure	850 hPa to 1,100 hPa
Process gas humidity	≤ 40% by vol.
Ambient temperature	–20 °C...+50 °C
Storage temperature	–20 °C to +70 °C
Ambient pressure	850 hPa to 1,100 hPa
Ambient humidity	≤ 90% relative humidity; non-condensing
Ex-approvals	
ATEX	3G IIC T3 Gc: Analyzer cabinet 3G IIC T3 Gc: Gas sampling unit 2G IIC T3 Gb: Sample gas line
Electrical safety	CE
Enclosure rating	IP65
Analog outputs	0/4 ... 20 mA, 500 Ω; number depends on system configuration
Analog inputs	0/4 to 20 mA, 100 Ω; number depends on system configuration; electrically isolated
Digital outputs	48 V AC, 0.5 A, 35 W / 48 V DC, 0.5 A, 24 W; number depends on system configuration; electrically isolated
Digital inputs	3.9 V, 4.5 mA, 0.55 W; number depends on system configuration
Modbus	✔
Type of fieldbus integration	TCP RTU RS-485
PROFIBUS DP	✔
Note	Option
PROFINET	✔
Note	Option
Ethernet	✔
Function	Connection to SOPAS ET software or OPC server
Indication	LC display, status LEDs
Input	Touchscreen
Operation	Via LC display or SOPAS ET software, multiple operating levels, password-protected
Menu language	German, English
Dimensions (W x H x D)	
Analyzer cabinet	1,000 mm x 2,100 mm x 652 mm (details see dimensional drawings)
Weight	
Analyzer cabinet	approx. 400 kg
Material system cabinet	Stainless steel Option: painted steel, GRP

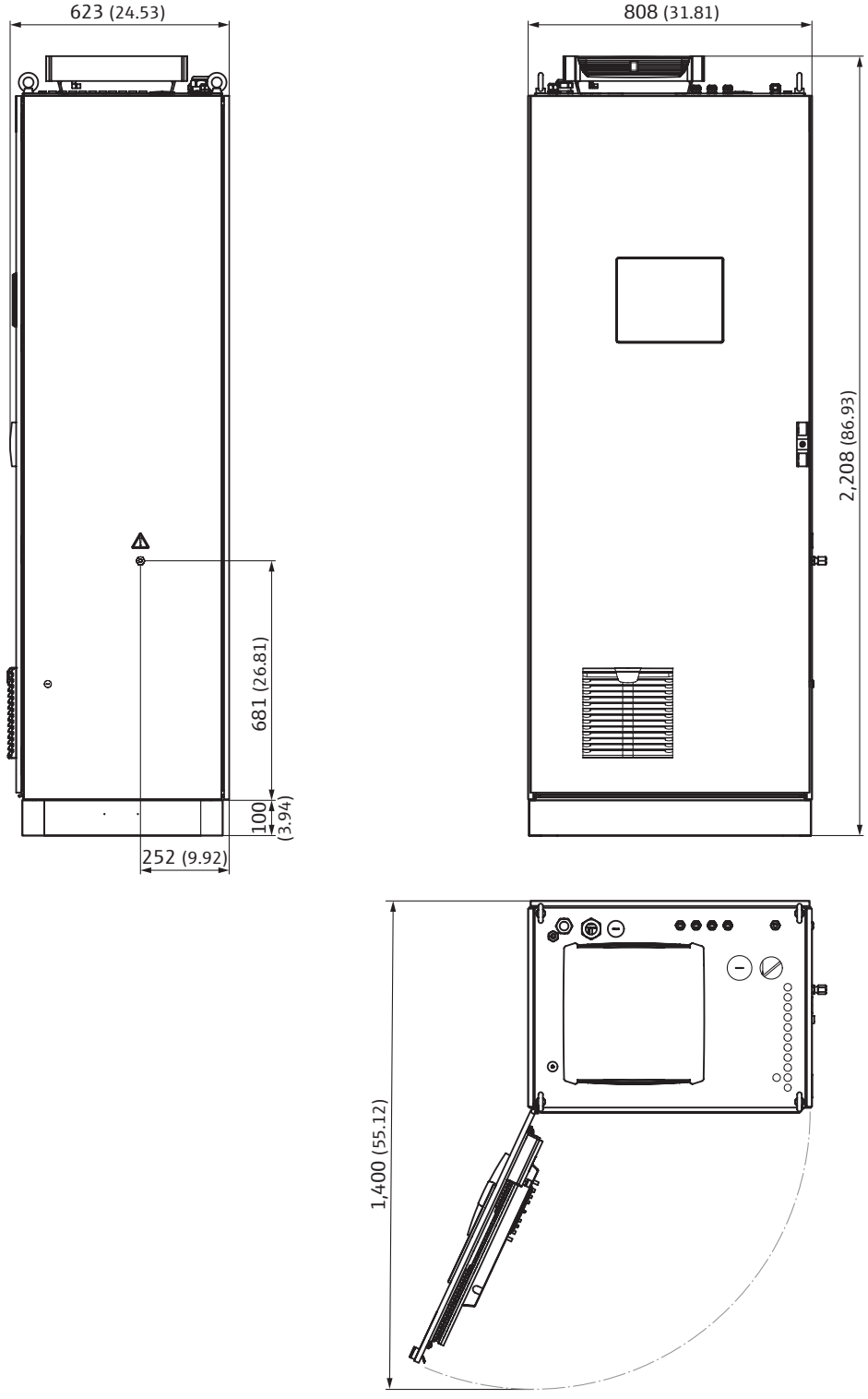
Power supply	
Voltage	115 V AC, ± 10% 230 V AC, ± 10%
Frequency	50 Hz / 60 Hz
Power consumption	Analyzer: ≤ 1,000 VA Sample gas line, heated: ≤ 90 VA/m Gas sampling unit: ≤ 600 VA
Auxiliaries	
Instrument air (purge unit):	39.3 m^3/h during pre-purging, ≤ 2 m^3/h during normal operation, 2.5 ... 4.5 bar, particle size max. 40 µm (purity class 5); oil content max. 1 mg/m^3 (purity class 3); pressure condensation point max. −20 °C (purity class 3)
Instrument air (zero gas quality):	≤ 350 l/h, 6 to 7 bar; particle size max. 1 µm; oil content max. 0.1 mg/m^3; pressure condensation point max. −40 °C, purity class 2 (ISO 8573)
Instrument air (propellant air for ejector):	≤ 1,300 l/h, 5 to 7 bar; particle size max. 5 µm; oil content max. 1 mg/m^3; pressure condensation point max. +3 °C, purity class 3 (ISO 8573)
Reference gas:	≤ 350 l/h, max. 4 bar; the reference gas must comply with the requirements of the applicable standards and guidelines
Sample connections	
Measuring gas input	Tube fitting connection for 8 mm pipes
Auxiliary connections	
Instrument air:	Tube fitting for 10 mm pipes
Reference gas	Tube fitting connection for 6 mm pipes
Exhaust gas outlet	Tube fitting for 10 mm pipes
Corrective functions	Drift correction and optical monitoring function via adjustment cell
Test functions	Automatic check cycle for zero and reference point
System components	Gas sampling unit Sample gas line Analyzer cabinet

Order Information

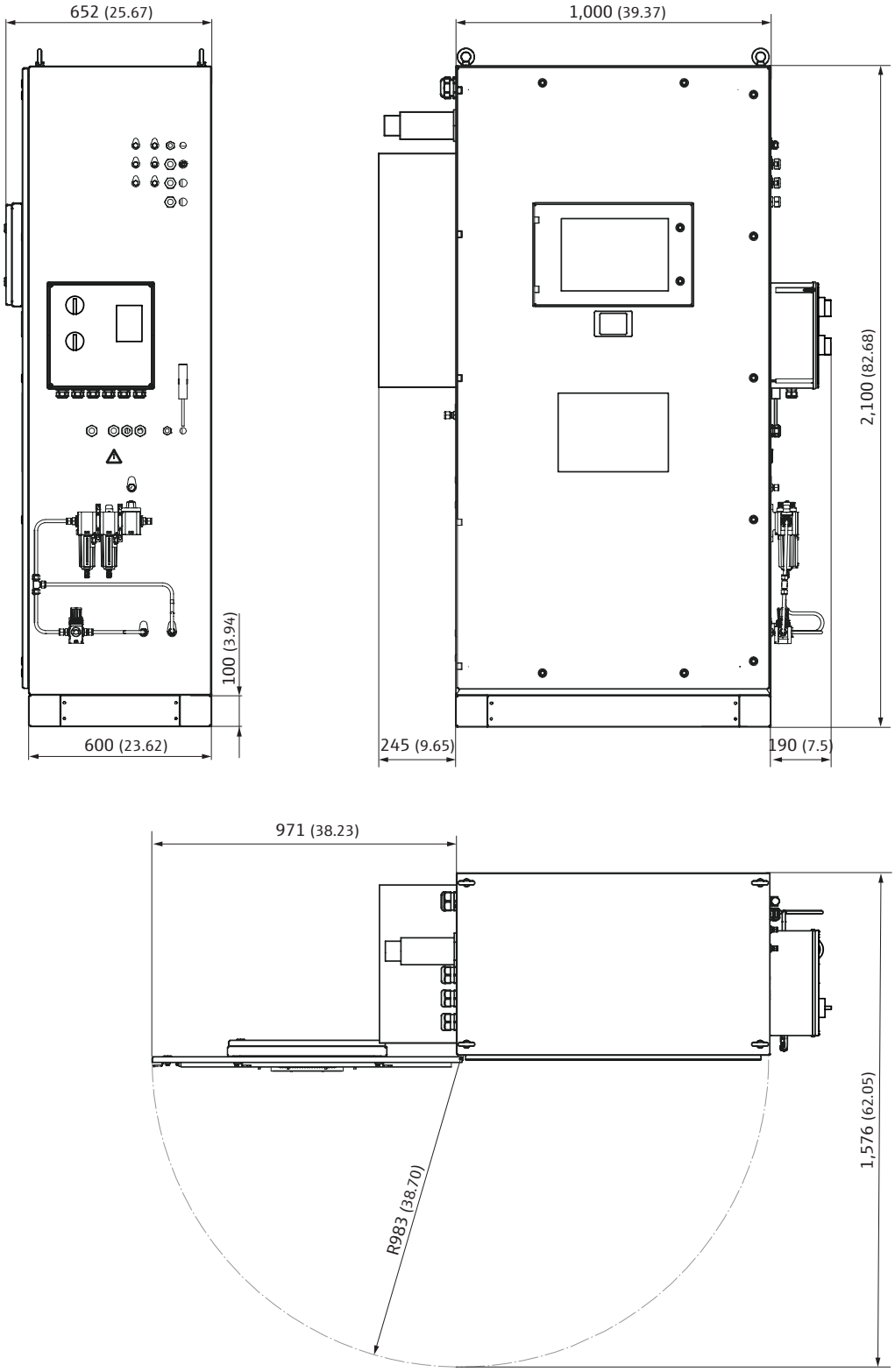
Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings

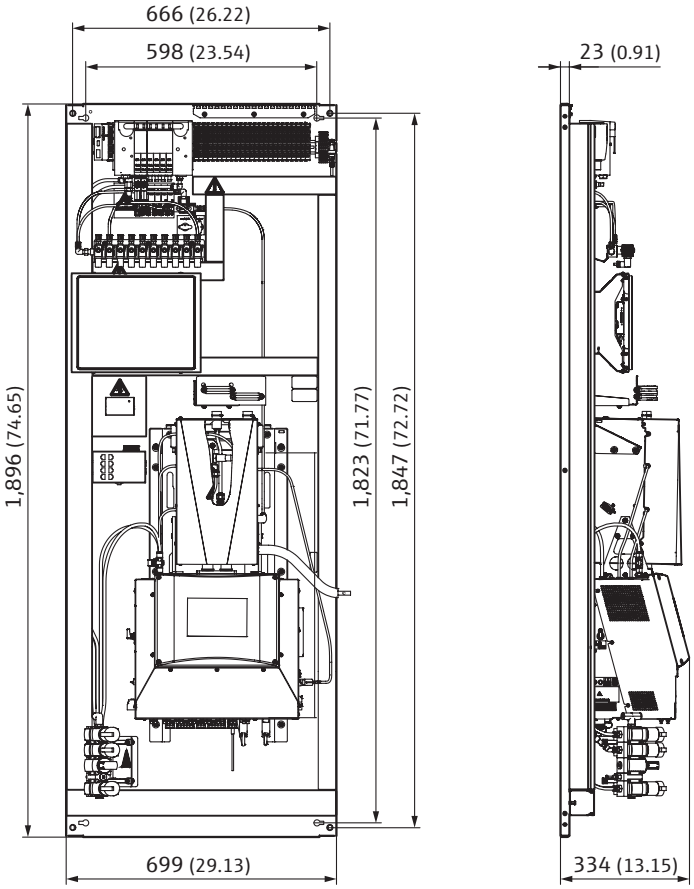
MCS200HW standard version (dimensions in mm (inch))



MCS200HW Ex system (dimensions in mm (inch))



MCS200HW mounting plate (dimensions in mm (inch))



Accessories

Digital Services for Integration

Short description	Type	Part no.
▪ **Application**: Condition Monitoring	Monitoring Box MCS200HW Basic	1616023
▪ **Description**: The Monitoring Box Basic is a scalable digital service for monitori ng service and process data.		
▪ **Hosting**: Off-premise: monitoringbox.endress.com, On-premise: Industrial PC or virtual machine on the user's servers		
▪ **Type**: App		
▪ **Contract type**: SaaS		
▪ **Contract interval**: Annual		
▪ **Supported products**: MCS200HW		
▪ **Vital data**: Operational status, Logbook, temperatures, Optical unit, Printed-circuit board assembly, Operating voltage, Frequencies, Drifts		
▪ **Version**: Release 1		

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from sustainable forestry.

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