

Analytical Application Sets

Continuous emission monitoring

Set CEM CERT

Overview



Set CEM CERT is a standardized and certified continuous emission monitoring system which is suitable for use in many plants requiring European legislation (13. BImSchV, 17. BImSchV, TA Luft, 2001/80/EC and IED 2010/75/EC, Annex V) approval. The innovative CEMS meets the current quality standards of EU directives EN 14956, EN 15267 and EN 14181 (QAL1/2/3, AST).

Benefits

- The tested measuring ranges can be selected for a variety of ranges to ensure use in different areas of application for the CEMS (suitability-tested according to EN 15267-3 (TÜV and MCERTS)).
- The complete modular package allows the certified use of system components from different manufacturers (suitability-tested according to EN 15267-3 (TÜV and MCERTS)).
- Simple and fast to configure
- Very low costs of procurement and operation

Modular design

- Up to 2 analyzers with different measuring ranges can be configured
- Selection of versions for indoor or outdoor installation
- Selection of sample gas cooler and NO_x converter from leading manufacturers
- Electric heaters and air conditioners can be configured to extend the ambient temperature range
- Selection of versions with appropriate sampling probes, heated sample gas lines

Application

- Emission monitoring of power plants fueled with solid, gaseous or liquid fuels
- Emission monitoring of so-called TA Luft plants
- In plants, where higher concentrations of corrosive aerosols (acid mist) are formed, precautions need to be taken to remove those out of the gas matrix. In such cases we strongly recommend a project specific technical clarification.

Design

Tested component design

The complete system consists of the following tested individual components:

- Sampling probe: M&C, type: SP2000; Bühler/Siemens, type: GAS222/7MB1943-2F
- Heated sample gas line: Winkler/Siemens, type: 7MB1943-2A
- Temperature controller: Siemens, type: SIRIUS
- Two-stage compressor gas cooler: M&C, type: CSS; Bühler, type: EGK 2-19
- Sample gas pump: Bühler/Siemens, type: P2.3/7MB1943-3C
- NO_x converter: M&C, type: CG-2

Performance-tested measuring ranges

Component	Analyzer module	Smallest certified measuring range	Additional measuring ranges
CO	U23-7MB2355	0 ... 200 mg/m ³	0 ... 750/ 3 000 mg/m ³
	U23-7MB2357	0 ... 200 mg/m ³	0 ... 750/ 3 000 mg/m ³
	U23-7MB2358	0 ... 250 mg/m ³	0 ... 1 250 mg/m ³
NO	U23-7MB2355	0 ... 150 mg/m ³	0 ... 750/ 2 000 mg/m ³
	U23-7MB2357	0 ... 150 mg/m ³	0 ... 750/ 2 000 mg/m ³
	U23-7MB2358	0 ... 400 mg/m ³	0 ... 2 000 mg/m ³
SO ₂	UV600	0 ... 50 mg/m ³	0 ... 100/ 1 000/2 000 mg/m ³
	U23-7MB2355	0 ... 400 mg/m ³	0 ... 2 000 mg/m ³
	U23-7MB2357	0 ... 400 mg/m ³	0 ... 2 000 mg/m ³
NO ₂	U23-7MB2358	0 ... 400 mg/m ³	0 ... 2 000/7 000 (in operation) mg/m ³
	UV600	0 ... 75 mg/m ³	0 ... 130/1 500/ 2 000 mg/m ³
	UV600	0 ... 50 mg/m ³	0 ... 500 mg/m ³
O ₂ , (paramag.)	U23	0 ... 25 vol %	
O ₂ , (electrochem.)	U23	0 ... 25 vol %	

Function

The complete tested modular measuring equipment is composed of the sampling probe, the heated sample gas line, a two-stage sample gas cooler, a gas pump and the multi-component analyzers, ULTRAMAT 23 and SIPROCESS UV600.

An electrochemical or a paramagnetic oxygen measuring cell can be used for the measurement of oxygen.

The gas path splits in parallel after the sample gas cooler. This separately supplies each analyzer with sample gas. One advantage for maintenance is that each analyzer can be individually serviced without affecting the other. The sample gas coolers used have a moisture alarm in case of malfunction. For additional protection, each analyzer is protected by a condensation barrier, which stops the gas flow if moisture penetrates. This guarantees optimum protection for gas analyzers.

For semi-automatic calibration of the zero and calibration gases, a 3/2-way solenoid valve is installed between the first and second cooling stages. The valve can also be used for AUTOCAL calibration of the ULTRAMAT 23 (fully automatic timing) as well as by the integrated PLC (LOGO module).

Technical specifications

Climatic conditions

Ambient temperature	+5° ... +40 °C (standard)
• With heater in sheet-steel cabinet	Min. -5 °C
• With heating in GRP cabinet	Min. -15 °C
• With air-conditioning	Max. +52 °C
Relative humidity	75 % (annual average), non-condensing

Sample gas conditions

Max. sample gas pressure at inlet to sample preparation system	500 hPa (mbar)
Max. moisture content in sample gas ¹⁾²⁾	<ul style="list-style-type: none"> • 17 vol % (cooler type: CSS), with PVDF heat exchanger • 25 vol % (cooler type: EGK 2-19), with glas heat exchanger
Sample gas temperature	Max. 200 °C at cabinet entry
Sample gas flow	Approx. 60 l/h per analyzer module
Sampling probe (standard)	Dust load: < 2 g/m ³
	Mounting flange: DN 65, PN 6, form B
	Including temperature controller with Pt100
	With internal sampling tube, stainless steel, length: 1 m (can be shortened)
	With filter in probe, to 600 °C
Sampling probe for higher temperatures and in other materials (optional)	On request
Sample gas line, electrically heated	Max. 50 m, longer lengths on request
Sample gas must not be flammable or explosive.	

Power supply

Supply 1	115 V AC, 50 ... 60 Hz (-15 %, +10 %); on request
Supply 2	230 V AC, 50 ... 60 Hz (-15 %, +10 %)
Supply 3	400 V AC, 50 ... 60 Hz (-15 %, +10 %)
Power	4 000 VA max.; without a heated sample gas line

System design

Fusing of electronic consumers	1-pole or 2-pole (selectable)
Sample gas cooler	2-stage
Output signals	4 ... 20 mA (corresponding to the analyzer information)
	Additional digital inputs and outputs via PLC (LOGO)
Color	RAL 7035
Weight	Approx. 160 kg
Sheet-steel cabinet/frame	Indoor installation
GRP cabinet	Outdoor installation
Explosion protection classification	Installation outside the Ex zone
Degree of protection	IP 54 (avoid direct sunlight for outdoor installation)
Calibration	Semi-automatic; AUTOCAL freely adjustable on U23 up to max. 24-hour interval

Detailed information on the analyzers

You can find detailed information on the analyzers:

- in the "Continuous Gas Analyzers, extractive" chapter
 - ULTRAMAT 23
 - SIPROCESS UV600

Dimensions

Sheet-steel cabinet (with base) for indoor installation	2 100 x 800 x 800 mm (H x W x D)
GRP cabinet (with base) for outdoor installation	2 060 x 900 x 800 mm (H x W x D)

500 mm spacing on the right or left must be provided for the cable inlet and connection of the heated sample gas line.

- ¹⁾ For NO- and SO₂- concentrations >500 mg/m³ the glas heat exchanger shall be used.
- ²⁾ In case of use of the SIPROCESS UV600 analyzer the cooler type EGK 2-19 has to be used due to the higher cooling capacity.

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Selection and ordering data

Product description	Article number
Performance-tested emission measuring system (EN 15267) for the continuous emission measurement	7MB1957- - - - - 0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Rack	
Sheet-steel cabinet (2 100 x 800 x 800 mm), hose/cable inlet left	0
Sheet-steel cabinet (2 100 x 800 x 800 mm), hose/cable inlet right	1
Control cabinet for outdoor installation (2 060 x 900 x 800 mm), GRP, hose/cable inlet left	4
Control cabinet for outdoor installation (2 060 x 900 x 800 mm), GRP, hose/cable inlet right	5
Sampling probe	
Sampling probe type: SP2000; Manufacturer: M&C	B
Sampling probe type: GAS 222; Manufacturer: Bühler	C
Ventilation/cooling	
Cabinet fan with outlet filter	B
Cabinet air conditioner for sheet-steel cabinet	C
Cabinet air-conditioner for GRP protective cabinet	D
Heating	
Without heating	0
Cabinet heating	1
Fuse protection	
1-pole	0
2-pole	1
Sample gas cooler	
Compressor gas cooler, type: CSS; Manufacturer: M&C	1
Compressor gas cooler, type: EGK 2-19, Manufacturer: Bühler	2
NO₂/NO converter	
Without NO ₂ /NO converter	A
NO ₂ /NO converter, type: CG series; Manufacturer: M&C	C
Power supply	
115 V AC, -15 %, +10 %, 50 Hz	A
230 V AC, -15 %, +10 %, 50 Hz	B
400 V AC, -15 %, +10 %, 50 Hz (3-phase)	C
Additional versions	Order code
Add "-Z" to article number and then order code	
Accessories	
Condensate tank with level monitoring	A03
Acidification module (for measuring low concentrations of SO ₂)	A04
Extractive analyzers, the analyzers must be ordered separately	
Preparation for the installation of an ULTRAMAT23	C01
Preparation for the installation of two ULTRAMAT 23	C02
Preparation for the installation of a SIPROCESS UV600	C03
Preparation for the installation of two SIPROCESS UV600	C04
Preparation for the installation of an ULTRAMAT 23 and a SIPROCESS UV600	C05
Sample gas line, electrically heated (with temperature controller and circuit breaker)	
Length: 5 m	D01
Length: 10 m	D02
Length: 15 m	D03
Length: 20 m	D04
Length: 25 m	D05
Length: 30 m	D06
Length: 35 m	D07
Length: 40 m	D08
Length: 45 m	D09
Length: 50 m	D10

Additional versions

Electronic overcurrent protection for heated sample gas line

(only required when heated sample line is not selected from options D01 to D07)

Circuit breaker, 4 A, for lengths up to 5 meters

Circuit breaker, 6 A, for lengths up to 10 meters

Circuit breaker, 8 A, for lengths up to 15 meters

Circuit breaker, 10 A, for lengths up to 20 meters

Circuit breaker, 16 A, for lengths up to 30 meters

Circuit breaker, 20 A, for lengths up to 35 meters

Documentation

German

English

French

Order code

D21

D22

D23

D24

D25

D26

N01

N02

N03

Dimensional drawings

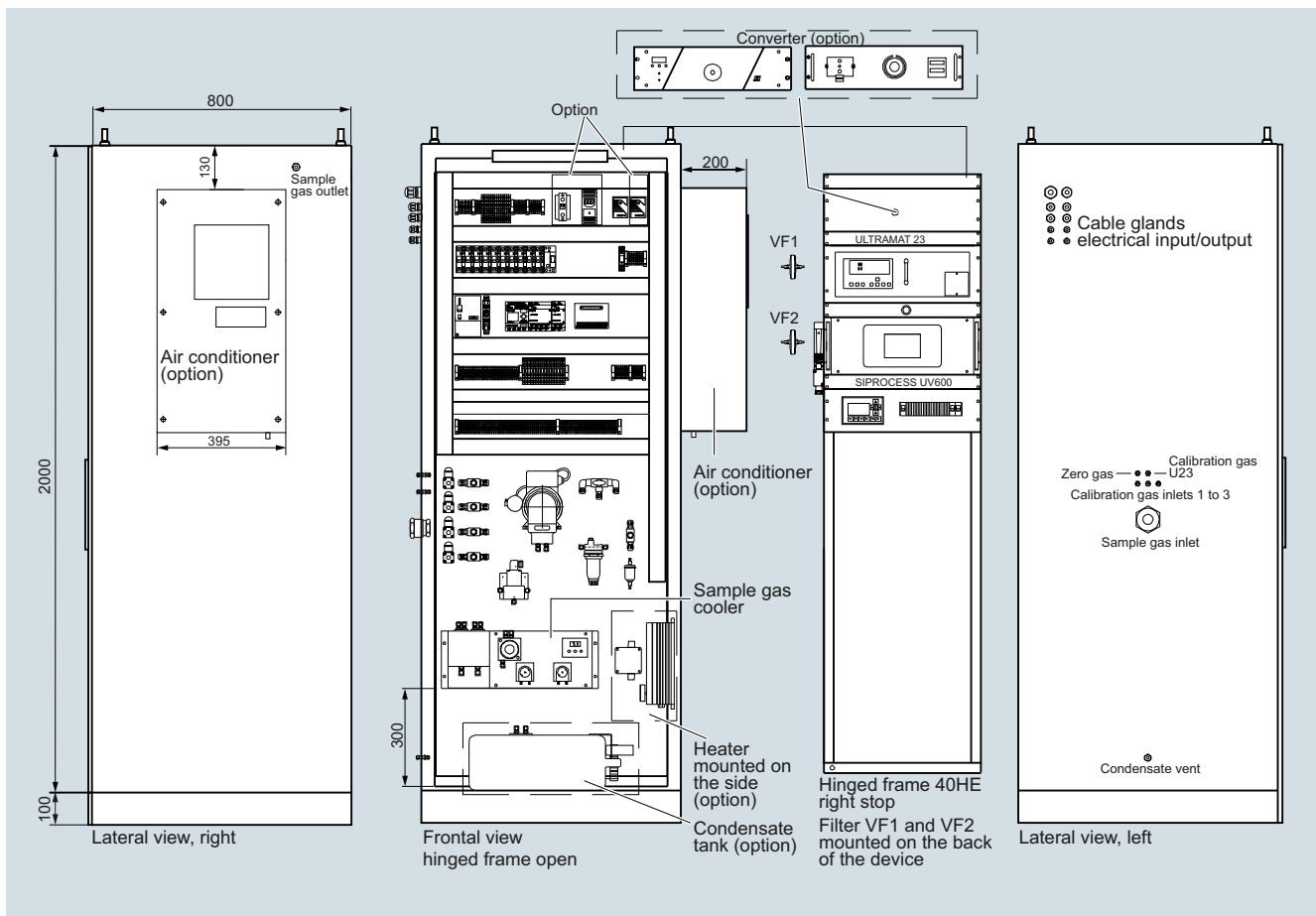


Figure contains options, dimensions in mm