

SIEMENS

Continuous gas analysis

Gas analyzer for measuring IR-absorbing gases, oxygen, and hydrogen sulfide




Compact operating instructions for ULTRAMAT 23

Compact User Manual

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

1 Introduction

1.1 Purpose of this documentation

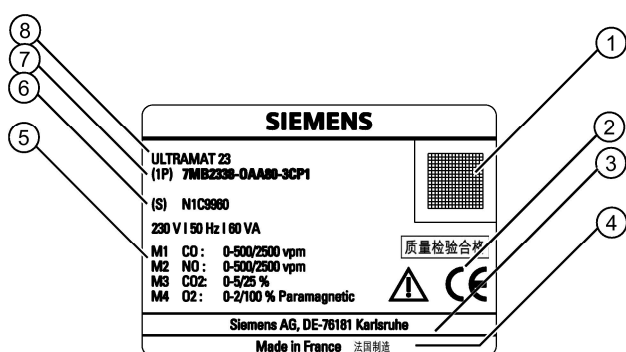
These instructions are a brief summary of important features, functions and safety information, and contain all information required for safe use of the device. Read the instructions carefully prior to installation and commissioning. In order to use the device correctly, first review its principle of operation.

The instructions are aimed at persons who mechanically assemble the device, connect it electrically, and start it up.

To achieve optimum usage of the device, read the detailed version of the instructions.

1.2 Product versions

The ULTRAMAT 23 gas analyzer is suitable for a wide variety of measurements and is therefore available in different versions. The data on the label, among others, indicates which device version you have.



- 1 Data matrix code
- 2 CE conformity symbol
- 3 Name and address of manufacturer
- 4 Designation of origin
- 5 Measuring range(s)
- 6 Serial number
- 7 Order No. (MLFB number) of the device
- 8 Device name

Figure 1-1 ULTRAMAT 23 label (example)

1.3 General information

This device left the factory in a safe and proper condition and has been tested. In order to maintain this condition and to ensure safe operation of this product, it should only be used in the manner described by the manufacturer. Furthermore, proper transportation, storage, installation, operation and maintenance of the device are vital for ensuring correct and safe operation.

This manual contains the information required for the intended use of the described product.

It is addressed to technically qualified personnel who are specially trained or who have the relevant knowledge of automation technology (measuring and control systems).

Knowledge and technically correct implementation of the safety notes and warnings contained in this manual are required for safe installation and commissioning, as well as for safety during the operation and maintenance of the described product. Only qualified personnel have the required professional knowledge for correctly interpreting the generally valid safety notes and warnings in this manual in each specific case and to act accordingly.

This manual is an inherent part of the scope of delivery, despite the fact that it can be ordered separately for logistic reasons.

Due to the variety of technical details, it is not possible to consider every single detail for all versions of the described product and for every conceivable case in the set-up, operation, maintenance and use in systems. For further information, or in the case of problems which are not covered in enough detail in this document, please request the required information from your local or responsible Siemens regional office.

1.4 Special information and warnings

This manual provides you with information on using, installing, operating, and maintaining the device.


Pay particular attention to all special information and warnings. Information of this type is set apart from the rest of the text and is marked with the corresponding pictograms. This information provides you with useful tips and helps avoid maloperations.

1.5 Proper use

Proper use within the context of this manual, means that the product may be used only for the applications described in the catalog or the technical description, and only in combination with the equipment, components and devices of other manufacturers recommended or permitted by Siemens.

The product described in this manual has been developed manufactured, tested and documented in compliance with relevant safety standards. When the handling rules described for the configuration, installation, proper operation and maintenance, as well as the safety guidelines are adhered to, therefore, there is normally no risk to the health of persons or in respect to damage to property.

This device was designed to ensure safe isolation of the primary and secondary circuits. Low voltages that are connected must therefore also be generated with safe isolation.

 WARNING
Dangerous contact voltage After removing the housing or protection against direct contact or after opening the system cabinet, certain parts of this device/system will be exposed that can carry hazardous voltage. Therefore, only appropriately qualified persons are permitted to perform work within this device. These persons must be thoroughly familiar with all sources of danger and service activities in accordance with these operating instructions.

1.6 Qualified Personnel

Qualified personnel are people who are familiar with the installation, mounting, commissioning, and operation of the product. These people have the following qualifications:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, high pressures and aggressive as well as hazardous media.
- For explosion-proof devices: they are authorized, trained, or instructed in carrying out work on electrical circuits for hazardous systems.
- They are trained or instructed in maintenance and use of appropriate safety equipment according to the safety regulations.

1.7 Warranty conditions

We expressly point out that the product quality is exclusively and conclusively described in the sales contract. The content of this product documentation is neither a part of a previous or existing agreement, promise or legal relationship, nor is it intended to modify these. All obligations on the part of Siemens AG are contained in the respective sales contract, which also contains the complete and solely applicable liability provisions. The provisions defined in the sales contract for the responsibility for defects are neither extended nor limited by the remarks in this document.

1.8 Delivery information

The respective scope of delivery is listed on the shipping documents in accordance with the valid sales contract. These are enclosed with the delivery.

When opening the packaging, please observe the corresponding information on the packaging material. Check the delivery for completeness and undamaged condition. In particular, the Order No. on the labels, if present, must be compared with the ordering data.

If possible, please keep the packaging material since you can reuse it for return deliveries if necessary.

1.9 Standards and regulations

As far as possible, the harmonized European standards were the basis for the specification and production of this device. If no harmonized European standards have been applied, the standards and regulations for the Federal Republic of Germany are valid.

When this product is used beyond the scope of these standards and regulations, the valid standards and regulations of the country of the operating company apply.

1.10 Conformity with European directives

The CE mark on the device is a sign of conformity with the following European directives:

Electromagnetic compatibility EMC	DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
Low voltage directive LVD	DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the harmonisation of the laws of Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
ATEX	DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

The directives applied can be found in the EU declaration of conformity for the associated device.

2 Safety instructions

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. The products and solutions from Siemens undergo continuous development with this factor in mind. Siemens strongly recommends that you regularly check for product updates.

For the safe operation of products and solutions from Siemens, it is necessary to take suitable protective measures (e.g. cell protection concept) and to integrate each component into an overall IT security concept which corresponds to state-of-the-art IT technology. Third-party products that may be in use should also be considered. For more information about industrial security, visit <http://www.siemens.com/industrialsecurity> (<http://www.siemens.com/industrialsecurity>).

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For further information, see <http://support.automation.siemens.com> (<http://support.automation.siemens.com>).

WARNING

Improper use

A device in the standard version must never be used in hazardous areas.

Explosive gas mixtures (e.g. flammable gases together with air or oxygen in a potentially explosive ratio) must not be measured with this analyzer.

WARNING

Improper device modifications

Danger to personnel, system and environment can result from modifications to the device, particularly in hazardous areas.

- Only carry out modifications that are described in the instructions for the device. Failure to observe this requirement cancels the manufacturer's warranty and the product approvals.

Note

Manipulation on the device

The physical access to the device allows illegal manipulations on the device.

- Ensure that the device is located in a protected area to which only authorized persons have access.
- If no settings need be carried out, lock the device.

2.1 Toxic and corrosive gases

WARNING

Toxic and/or corrosive gases

When measuring toxic or corrosive gases, it could occur that sample gas accumulates in the analyzer because of leaks in the gas path.

To prevent the danger of poisoning or damage to parts of the analyzer, the analyzer or the system must be purged with inert gas (e.g. nitrogen). The gas displaced by purging must be collected using appropriate equipment and disposed of environmentally-friendly via an exhaust line.

2.2 Analyzers in biogas plants

DANGER

Danger of poisoning

This device is designed to measure hydrogen sulfide and dihydrogen sulfide, H_2S !

Hydrogen sulfide is highly toxic even in small concentrations! The odor threshold for hydrogen sulfide is very low at 0.02 vpm (20 vpb), but higher concentrations result in numbing of the olfactory receptors in the nose so that the odor is no longer perceived. Persons exposed to this gas in concentrations up to 100 vpm for several hours exhibit symptoms of poisoning such as fatigue, headaches, lack of appetite, lack of concentration, irritation of the mucous membranes of eyes and respiratory tract, and throat irritations.

Inhalation of H_2S concentrations of 500 vpm longer than 30 minutes can cause fatal poisoning. Concentrations above 1 000 vpm cause death within a few minutes, concentrations above 5 000 vpm cause death within a few seconds!

When using this device in plant where there may be high concentrations of H_2S and you therefore need to take following continual precautions to prevent the effects of poisoning:

- Connect the gas outlet of the analyzer to a gas exhaust unit so that no gas can escape into the environment!
- Before you begin maintenance on the analyzer, make sure that the H_2S concentration in the analyzer is close to 0 vpm. Before beginning work, always flush the gas path of the analyzer and the gas sampler with ambient air or nitrogen for a duration of about 10 minutes .
- Check for leaks in the analyzer at regular intervals!

DANGER

Danger of explosion

When the device is used in biogas plants, you should expect that the sample gas will contain methane, which forms explosive mixtures with oxygen or air in certain concentrations. These conditions might occur under certain operating states of the plant. These operating states are to be avoided in the plant.

2.3 Analyzers in hazardous areas

WARNING

Unsuitable device for the hazardous area

Danger of explosion.

- Only use equipment that is approved for use in the intended hazardous area and labelled accordingly.

3 installation

DANGER

Explosion hazard

If a flammable or ignitable atmosphere exists, plugs must never be disconnected or lamps/fuses replaced when the analyzer is supplied with power.

ATEX Zone 2

The following applies to devices (special versions) which are operated according to ATEX in Ex zone 2:

DANGER

Explosion hazard

The ULTRAMAT 23 gas analyzers for use in Ex zone 2 must be installed in a lockable enclosure. This enclosure must comply with the requirements of EN 60079-7 and must be designed for all ambient conditions which can occur during operation. This enclosure only be opened using a tool (e.g. a key).

The ambient temperature is 5 °C to 45 °C

Suitable measures must additionally be applied to ensure that

- the generation of potentially explosive gas mixtures inside the analyzer does not exceed the level of Zone 2
- interferences cannot lead to a deviation of more than 40% from the rated voltage.
- the location of the device has a maximum degree of pollution 2
- the maximum permissible overvoltage category II is adhered to.

4 Connecting

4.1 Safety instructions

4.1.1 Laws and directives

Observe the test certification, provisions and laws applicable in your country during connection, assembly and operation. These include, for example:

- National Electrical Code (NEC - NFPA 70) (USA)
- Canadian Electrical Code (CEC) (Canada)

Further provisions for hazardous area applications are for example:

- IEC 60079-14 (international)
- EN 60079-14 (EC)

4.1.2 Electrical circuit breaker in accordance with IEC 60947-1

Note

Electrical circuit breaker in accordance with IEC 60947-1 and IEC 60947-3

In accordance with IEC 60947-1 "Standard for low-voltage switchgear and controlgear" and IEC 60947-3 "Switches, disconnectors, fuses" you require an electrical circuit breaker for the device.

We recommend commercially available automatic circuit breakers.

4.1.3 Dangerous contact voltage

WARNING

Dangerous contact voltage

Danger of electric shock in case of incorrect connection.

- For the electrical connection specifications, refer to the information in Chapter "Electrical connection (Page 9)".
- At the mounting location of the device observe the applicable directives and laws for installation of electrical power installations with rated voltages below 1000 V.

4.1.4 Missing PE/ground connection

WARNING

Missing PE/ground connection

Danger of electric shock.

Depending on the device version, connect the power supply as follows:

- **Power plug:** Ensure that the used socket has a PE/ground conductor connection. Check that the PE/ground conductor connection of the socket and power plug match each other.
- **Connecting terminals:** Connect the terminals according to the terminal connection diagram. First connect the PE/ground conductor.

4.1.5 Power supply cable for bench-top unit

Note

Disconnecting means

The power supply cable also serves as the disconnecting means.

Make sure that the cable is

- clearly recognizable
- easy to reach.

The cable length must not exceed 3 m.

4.1.6 Analyzers in hazardous areas

DANGER

Explosion hazard

If a flammable or ignitable atmosphere exists, plugs must never be disconnected or lamps/fuses replaced when the analyzer is supplied with power.

DANGER

Potentially explosive atmosphere

The analyzer keys must not be pressed if a potentially explosive atmosphere may be present.

If operation using the keyboard is necessary, a hot work permit is absolutely essential.

4.2 Electrical connection

4.2.1 Connection of the signal lines

NOTICE

Incorrect power supply

The 24 V/1 A power supply must be a power-limited safety extra-low voltage with safe electrical isolation (SELV). Only connect the signal lines to devices which also have reliable electric isolation from their power supply.

- The connection lines to the relay outputs, binary inputs, and analog outputs must be shielded.
- The analog outputs are floating, but have a common negative pole.
- As a measure to suppress sparking across the relay contacts (e.g. limit relays), RC elements must be connected as shown in the following figure. Note that the RC element results in a drop-out delay for an inductive component (e.g. solenoid valve). The RC element should be sized according to the following rule of thumb:
 - $R = R_L/2$; $C = 4L/R^2_L$,
where $R = 100\ \Omega$ and $C = 200\ \text{nF}$ are sufficient.
 - You must use a non-polarized capacitor for the RC element.

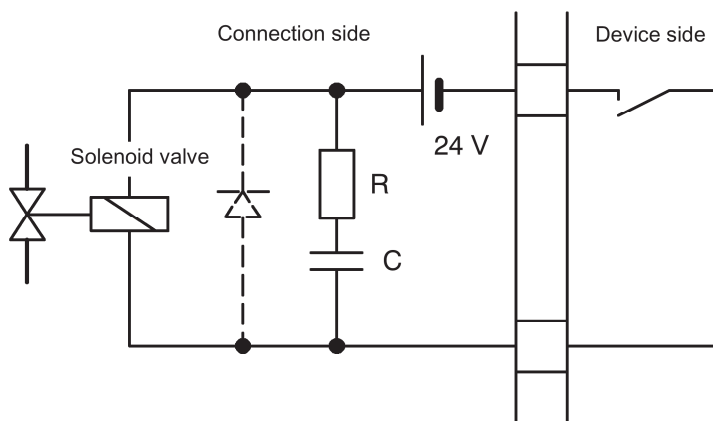


Figure 4-1 Measure to suppress sparks on a relay contact

When operated with direct current, a spark suppression diode can be installed instead of the RC element.

Connect the signal lines to the Sub-D plugs at the rear of the device.

Refer to the ELAN interface description (Order No. C79000-B5200-C176 German, C79000-B5276-C176 English) for details on the interface cable.

4.2.2 Power connection

NOTICE
Incorrect power supply Check before connecting that the existing supply voltage corresponds to that specified on the label of the device. Install the power line separately from the signal lines.

A power supply cable or an appliance plug is enclosed with the device, and must only be connected by qualified personnel (see Qualified Personnel (Page 3)). The cable is connected to the appliance socket at the rear of the device. At the power supply end, the cable is inserted into a mains socket.

19" rack unit

A flexible cable suitable for power supply cords must be connected to the appliance plug. The cross-section of each conductor must be at least 1 mm². The cross-section of the PE conductor must not be smaller than that of the L and N conductors. The cable must be suitable for a temperature of at least 70 °C (158 °F) and must be approved for the country of use or the location.

A readily accessible facility for mains disconnection must be provided in the immediate vicinity of the analyzer.

Bench-top unit

A power supply cable must be used which is approved for the country of use or the location. The minimum cross-section of each conductor must be at least 0.75 mm² as long as the maximum length of the cable does not exceed 2 m (6 1/2 ft). Longer cables require larger conductor cross-sections than 0.75 mm². The cable must at least be suitable for a temperature of 70 °C (158 °F).

When positioning the analyzer, make sure that the power connector at the rear is accessible at all times.

Note

Disconnecting means

The power supply cable also serves as the disconnecting means.

Make sure that the cable is

- clearly recognizable
- easy to reach.

The cable length must not exceed 3 m.

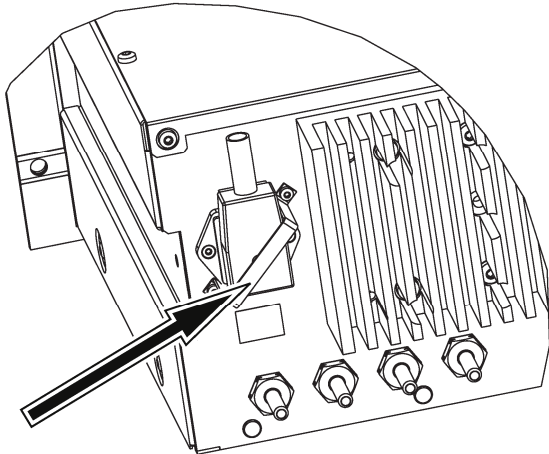
Electrical circuit breaker in accordance with IEC 60947-1 and IEC 60947-3

In accordance with IEC 60947-1 "Standard for low-voltage switchgear and controlgear" and IEC 60947-3 "Switches, disconnectors, fuses" you require an electrical circuit breaker for the device.

We recommend commercially available automatic circuit breakers.

Ex analyzers

The following applies to all devices in the hazardous area:



Analyzers envisaged for use in hazardous areas must be provided with a safety bracket which protects the power connector from being unintentionally disconnected (see arrow in above picture). This bracket is enclosed loose with the analyzer and must be attached before switching on.

5 Commissioning

5.1 General information

The analyzer has been parameterized and calibrated prior to delivery. However, a large number of parameters can be subsequently adapted to specific requirements using menu-based functions.

The following sections provide you with information on the display and operator panel as well as the operating modes. You will learn how to scan analyzer statuses, how to calibrate the analyzer, and how you can enter or modify parameters.

The input sequences are described using the maximum configuration. If your analyzer has a different configuration (different measured components, number of infrared ranges, no oxygen measuring cell, no pump, no serial interface etc.), the explanations can be applied accordingly.

The used numbers must be considered as examples. They therefore probably differ from the values displayed on your analyzer. The corresponding line remains empty if components are not present in your analyzer.

If analyzers are installed in closed analysis cabinets, opening the cabinet door may result in brief drifting of the measured values. This is a result of the temperature exchange which then takes place.

5.2 Safety instructions

5.2.1 Hazardous contact voltage

WARNING

Hazardous contact voltage

Risk of injury through hazardous contact voltage when the device is open or not completely closed.

The degree of protection specified on the nameplate or in Technical specifications (Page 15) is no longer guaranteed if the device is open or not properly closed.

- Make sure that the device is securely closed.

5.2.2 Loss of degree of protection

CAUTION

Loss of degree of protection

Damage to device if the enclosure is open or not properly closed. The degree of protection specified on the nameplate or in Chapter "Technical specifications (Page 15)" is no longer guaranteed.

- Make sure that the device is securely closed.

5.2.3 Commissioning and operation with error message

WARNING

Commissioning and operation with pending error

If an error message appears, correct operation in the process is no longer guaranteed.

- Check the gravity of the error.
- Correct the error.
- If the error still exists:
 - Take the device out of operation.
 - Prevent renewed commissioning.

5.2.4 For use in hazardous areas

5.2.4.1 Analyzers in hazardous areas

DANGER

Explosion hazard

If a flammable or ignitable atmosphere exists, plugs must never be disconnected or lamps/fuses replaced when the analyzer is supplied with power.

WARNING

Potentially explosive atmosphere

Do not open, service or repair the device in an area in which a potentially explosive atmosphere may be present.

6 Service and maintenance

6.1 Safety instructions

6.1.1 General safety instructions



CAUTION

Dangerous voltage at open device

Danger of electric shock when the enclosure is opened or enclosure parts are removed.

- Before you open the enclosure or remove enclosure parts, de-energize the device.
- If maintenance measures in an energized state are necessary, observe the particular precautionary measures. Have maintenance work carried out by qualified personnel.



WARNING

Hot, toxic or corrosive process media

Danger of injury during maintenance work.

When working on the process connection, hot, toxic or corrosive process media could be released.

- As long as the device is under pressure, do not loosen process connections and do not remove any parts that are pressurized.
- Before opening or removing the device ensure that process media cannot be released.



WARNING

Impermissible repair and maintenance of the device

- Repair and maintenance must be carried out by Siemens authorized personnel only.



CAUTION

Electrostatic discharges

The electronic components and modules fitted in this device can be destroyed by electrostatic discharging.

Comprehensive measures (such as the wearing of protective clothing by the maintenance personnel) must therefore be made to prevent electrostatic discharging wherever they are manufactured, tested, transported and installed.



WARNING

Danger of chemical burns

The O₂S sensor contains acetic acid, which leads to burns on unprotected skin.

Therefore do not use any tools when replacing the sensor module which could damage the sensor due to sharp edges or squeezing.

If contact with the acid occurs nevertheless, rinse the affected skin immediately with plenty of water!



WARNING

Danger of chemical burns

The H₂S sensor contains sulfuric acid, which leads to burns on unprotected skin.

Therefore do not use any tools when replacing the sensor module which could damage the sensor due to sharp edges or squeezing.

If contact with the acid occurs nevertheless, rinse the affected skin immediately with plenty of water!

6.1.2 Safety information for analyzers used in hazardous areas

WARNING

Impermissible repair and maintenance of the device

- Repair and maintenance must be carried out by Siemens authorized personnel only.

WARNING

Electrostatic charge

Danger of explosion in hazardous areas if electrostatic charges develop, for example, when cleaning plastic surfaces with a dry cloth.

- Prevent electrostatic charging in hazardous areas.

WARNING

Maintenance during continued operation in a hazardous area

There is a danger of explosion when carrying out repairs and maintenance on the device in a hazardous area.

- Isolate the device from power.
- or -
- Ensure that the atmosphere is explosion-free (hot work permit).

WARNING

Impermissible accessories and spare parts

Danger of explosion in areas subject to explosion hazard.

- Only use original accessories or original spare parts.
- Observe all relevant installation and safety instructions described in the instructions for the device or enclosed with the accessory or spare part.

WARNING

Improper connection after maintenance

Danger of explosion in areas subject to explosion hazard.

- Connect the device correctly after maintenance.
- Close the device after maintenance work.

Refer to Connecting (Page 7).

DANGER

Potentially explosive atmosphere

The analyzer keys must not be pressed if a potentially explosive atmosphere may be present.

If operation using the keyboard is necessary, a hot work permit is absolutely essential.

7 Technical specifications

7.1 General technical data

General information	
Measured components	Maximum of 4, comprising up to three infrared-sensitive gases as well as oxygen and/or hydrogen sulfide (H ₂ S is not available with 3 infrared-sensitive gases)
Operating position	Front panel vertical
Shocks / maximum vibration	No shocks; maximum vibration 5 m/s ²
Enclosure	
Weight	Approx. 10 kg (22 lbs.) The weight varies according to the ordered variant.
Degree of protection	IP40 in accordance with EN 60529 for the versions 7MB235x (TÜV) IP20 in accordance with EN 60529 for the versions 7MB233x (standard)
Electrical characteristics	
EMC interference immunity (with safety extra-low voltage (SELV) with safe isolation)	In accordance with standard requirements of NAMUR NE21 or EN 61326-1
Power supply	100 V AC, +10%/-15%, 50 Hz, 120 V AC, +10%/-15%, 50 Hz, 200 V AC, +10%/-15%, 50 Hz, 230 V AC, +10%/-15%, 50 Hz, 100 V AC, +10%/-15%, 60 Hz, 120 V AC, +10%/-15%, 60 Hz, 230 V AC, +10%/-15%, 60 Hz
Power consumption	Approx. 60 VA depending on ordered version
For application in hazardous areas	It has to be guaranteed that the transient protection is set to a value that does not exceed 140% of the measured peak voltage value at the device power supply connectors.
Electrical inputs and outputs	
Analog outputs	1 analog current output per component, 0/2/4/NAMUR ... 20 mA, floating, max. load 750 Ω
Relay outputs	8, with changeover contacts, freely selectable, e.g. for fault, loading capacity 24 V AC/DC/1 A, floating
Binary inputs	3, dimensioned for 24 V, floating <ul style="list-style-type: none"> • Pump • AUTOCAL • Synchronization
Serial interface	ELAN (RS485), PROFIBUS-PA/DP as option

Climatic conditions

Permissible ambient temperature

- During operation 5...45 °C
- During transportation and storage -20...60 °C

Permissible ambient humidity < 90% RH (relative humidity) during transportation and storage (see manual)

Maximum operating altitude 2000 m above sea level

Pollution degree 2

Sample pressure < 1200 hPa absolute

Gas inlet conditions

Sample gas pressure

- Without pump Unpressurized (< 1200 hPa (17.4 psi) absolute)
- With pump Unpressurized suction mode, set in factory with 2 m (6 1/2 ft) hose at sample gas outlet; full-scale value calibration necessary under different venting conditions

Sample gas flow 72 ... 120 l/h (1.2 .. 2 l/min)

Sample gas temperature 0 ... 50 °C (32 ... 122 °F)

Sample gas humidity < 90 % RH (relative humidity), non-condensing

Note

Since measuring ranges can be changed, all accuracy data applies to the ranges specified on the label!

7.2 Parts in gas path wetted by sample gas

Gas path	19" rack unit	Bench-top unit
With hoses	Condensation trap at gas inlet	-- PA6 (polyamide)
	Condensation trap	-- PE (polyethylene)
	Gas connections 6 mm	PA6 (polyamide) PA6 (polyamide)
	Gas connections ¼"	Stainless steel 1.4571 Stainless steel 1.4571
	Hose	FKM FKM
	Pressure switch	PTFE + PA6 (polyamide) PTFE + PA6 (polyamide)
	Flowmeter	Borosilicate glass/steel 1.4878 Borosilicate glass/steel 1.4878
	Elbows/T-pieces	PA6 PA6
	Internal pump (optional)	PVDF/PTFE/FKM/HD-PE/ stainless steel 1.4571 PVDF/PTFE/FPM/HD-PE/ stainless steel 1.4571
	Solenoid valve	FPM70/PA6/ stainless steel 1.4310/1.4305 FPM70/PA6/ stainless steel 1.4310/1.4305
	Safety condensation trap	PA66/NBR/PA6 PA66/NBR/PA6
	Analyzer chamber	
	• Body	Aluminum Aluminum
	• Lining	Aluminum Aluminum
	• Nozzle	Stainless steel 1.4571 Stainless steel 1.4571
	• Window	CaF ₂ CaF ₂
	• Adhesive	Epoxy resin Epoxy resin
	• O-ring	FKM FKM
Piped (only possible without pump)	Gas connections 6 mm / ¼"	Stainless steel 1.4571
	Pipes	Stainless steel 1.4571
Analyzer chamber		
	• Body	Aluminum Aluminum
	• Lining	Aluminum Aluminum
	• Nozzle	Stainless steel 1.4571 Stainless steel 1.4571
	• Window	CaF ₂ CaF ₂
	• Adhesive	Epoxy resin-based adhesive Epoxy resin-based adhesive
	• O-ring	FKM FKM

8 Taking out of operation and disposal

The ULTRAMAT 23 may be taken out of operation for the following reasons:

- Repair
- New location of use
- Scrapping

8.1 Repair or changing of location

If the ULTRAMAT 23 is shut down for repair or for changing the location of use, proceed as follows:

DANGER

When the device is used in hazardous areas

A hot work permit is required for hazardous areas.

1. Make sure that gas is no longer flowing through the analyzer. If external pumps are present, switch all of them off.
2. Purge the sample gas path with air or nitrogen.
3. Switch the analyzer off.
4. Disconnect the power plug.
5. Disconnect all hose connections from the rear of the analyzer.
With pipe versions, unscrew all pipes.

WARNING

Danger of chemical burns

The O₂S sensor contains acetic acid, which leads to burns on unprotected skin.

Therefore do not use any tools when replacing the sensor module which could damage the sensor due to sharp edges or squeezing.

If contact with the acid occurs nevertheless, rinse the affected skin immediately with plenty of water!

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A Appendix

A.1 Service and support

Technical support is available on the Internet at: Services & Support (<http://www.siemens.com/automation/service&support>)

Your regional Siemens representative can be found here: Contact partner (<http://www.automation.siemens.com/mcms/aspa-db/en/automation-technology/Pages/default.aspx // XmlEditor.InternalXmlClipboard:2b8c9950-1d49-ffc1-5ad9-f7f0b769b59f>)

A.2 Approvals

CE	EN 61000-6-2, EN 61000-6-4 (replaces EN 50081-2)
ATEX	EN 60079-0 : 2012 + A11:2013
Zone 2	EN 60079-7 : 2015 EN60079-15 : 2010 EN 60079-11 : 2012 II 3G Ex ec ic nC IIC T4 Gc
BVS	16 ATEX E 061 X
IECEX	BVS 160041X Ex ec ic nC IIC T4 Gc
Class/Div	Cl. I, Div 2, Gps ABCD Cl I, ZN2 Ex ec ic NC IIC TA Gc Cl i, ZN 2 AEx ec ic nC IIC T4 Gc

Note

Combustible gases / gas mixtures

The analysis of combustible gasses and gas mixtures is not permitted.

B List of abbreviations

B.1 List of abbreviations

Table B-1

Abbreviation/symbol	Description
ATEX	A tmosphère exp losible (French for explosive atmosphere)
BImSchV	B undes im missionss sch utz v erordnung (Federal German Emission Protection Directive)
CE	C ommunauté E uropéenne (French for European Community)
CSA	C anadian S tandards A ssociation, a technical testing organization
DIN	D eutsches I nstitut für N ormung e. V. (German standards association)
EU	E uropean U nion
EN	E uropäische N orm (European standard)
EPDM	E thylene P ropylene D iene M onomer, a plastic
ESD	E lectrostatic D ischarge
IEC	I nternational E lectrotechnical C ommission
IEEE	I nstitute of E lectrical and E lectronics E ngineers
ISO	I nternational Standards Organization (from Greek: " Isos "; in English "equal")
MLFB	Machine-readable Order No. (German M aschinenlesbare F abrikate B ezeichnung)
NAMUR	N ormen a rbeitsgemeinschaft für M ess- und R egeltechnik in der chemischen Industrie (standardization body for instrumentation and control technology in the chemical industry)
NFPA	N ational F ire P rotection A ssociation, a non-profit fire protection organization in the USA
PI	P ROFIBUS I nternational
PROFIBUS	P rocess F ield B us
PTB	P hysikalisch- T echnische B undesanstalt (German technical inspectorate)
QAL	Q uality A ssurance L evel
SIPROM GA	S iemens P rocess M aintenance for G as A nalyzers
TA Luft	T echnical I nstructions on A ir Q uality C ontrol (Germany)
TÜV	T echnischer Ü berwachungs v erein, German Technical Inspectorate
LEL	L ower E xplosion L imit
VDE	V erband d er E lektrotechnik, E lektronik und I nformationstechnik (German Association for Electrical, Electronic and Information Technologies)

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