

Overview



The ULTRAMAT 6 single-channel or dual-channel gas analyzers operate according to the NDIR two-beam alternating light principle and measure gases highly selectively whose absorption bands lie in the infrared wavelength range from 2 to 9 μm , such as CO, CO₂, NO, SO₂, NH₃, H₂O as well as CH₄ and other hydrocarbons.

Single-channel analyzers can simultaneously measure up to 2 gas components, while dual-channel analyzers can simultaneously measure 3 (or 4 on request) gas components.

Benefits

- High selectivity with double-layer detector and optical coupler
 - Reliable measurements even in complex gas mixtures
- Low detection limits
 - Measurements with low concentrations
- Corrosion-resistant materials in gas path (option)
 - Measurement possible in highly corrosive sample gases
- Analyzer cells can be cleaned as required on site
 - Cost savings due to reuse after contamination
- Electronics and physics: gas-tight isolation, purging is possible, IP65
 - Long service life even in harsh environments
- Heated versions (option)
 - Use also in presence of gases condensing at low temperature
- Ex(p) for zones 1 and 2 (according to ATEX 2G and ATEX 3G)

Application

Areas of application

- Measurement for boiler control in incineration plants
- Emission measurements in incineration plants
- Measurement in the automotive industry (test benches)
- Warning equipment
- Process gas concentrations in chemical plants
- Trace measurements in pure gas processes
- Environmental protection
- TLV (Threshold Limit Value) monitoring at the workplace
- Quality monitoring
- Ex versions for analyzing flammable and non-flammable gases or vapors for use in hazardous areas

Special versions

Special applications

Besides the standard combinations, special applications concerning material in the gas path, material in the sample cells (e.g. Titan, Hastelloy C22) and measured components are also available on request

TÜV version/QAL

TÜV-approved versions are available for measurement of CO, NO and SO₂ according to 13th and 17th BImSchV and TA Luft. Smallest TÜV-approved and permitted measuring ranges:

- 1-component analyzer
 - CO: 0 to 50 mg/m³
 - NO: 0 to 100 mg/m³
 - SO₂: 0 to 75 mg/m³
- 2-component analyzer (series connection)
 - CO: 0 to 75 mg/m³
 - NO: 0 to 200 mg/m³

Furthermore, the TÜV-approved versions of the ULTRAMAT 6 comply with the requirements of EN 14956 and QAL 1 in accordance with EN 14181. Conformity of the analyzers with both standards is TÜV-certified.

The analyzer drift can be determined in accordance with EN 14181 (QAL 3) either manually or with a PC using the SIPROM GA maintenance and servicing software. In addition, selected manufacturers of emission evaluation computers offer the possibility for downloading the drift data via the analyzer's serial interface and to automatically record and process it in the evaluation computer.

Flow-type reference compartment

- The flow through the reference compartment should be adapted to the sample gas flow
- The gas supply of the reduced flow-type reference compartment should have an upstream pressure of 3 000 to 5 000 hPa (abs.). Then a restrictor will automatically adjust the flow to approximately 8 ml/min

Design

19" rack unit

- 19" rack unit with 4 HU for installation
 - in hinged frame
 - in cabinets with or without telescopic rails
- Front plate for service purposes can be pivoted down (laptop connection)
- Internal gas paths: hose made of FKM (Viton) or pipe made of titanium or stainless steel
- Gas connections for sample gas inlet and outlet: pipe diameter 6 mm or 1/4"
- Flow indicator for sample gas on front plate (option)
- Pressure switch in sample gas path for flow monitoring (option)

Field device

- Two-door enclosure with gas-tight separation of analyzer and electronics sections from gas path
- Individually purgeable enclosure halves
- Parts in contact with sample gas can be heated up to 65 °C (option)
- Gas path: hose made of FKM (Viton) or pipe made of titanium or stainless steel (further materials possible as special applications)
- Gas connections for sample gas inlet and outlet: pipe union for pipe diameter 6 mm or 1/4"
- Purging gas connections: pipe diameter 10 mm or 3/8"

Continuous Gas Analyzers, extractive ULTRAMAT 6

General information

Display and control panel

- Large LCD field for simultaneous display of:
 - Measured value (digital and analog displays)
 - Status bar
 - Measuring ranges
- Contrast of the LCD field adjustable via the menu
- Washable membrane keyboard with five softkeys
- Menu-driven operator control for parameterization, test functions, adjustment
- Operator support in plain text
- Graphic display of concentration trend; programmable time intervals
- Bilingual operating software: German/English, English/Spanish, French/English, Spanish/English, Italian/English

Input and outputs

- One analog output per medium (from 0, 2, 4 to 20 mA; NAMUR parameterizable)
- Two analog inputs freely configurable (e.g. correction of cross-interferences or external pressure sensor)

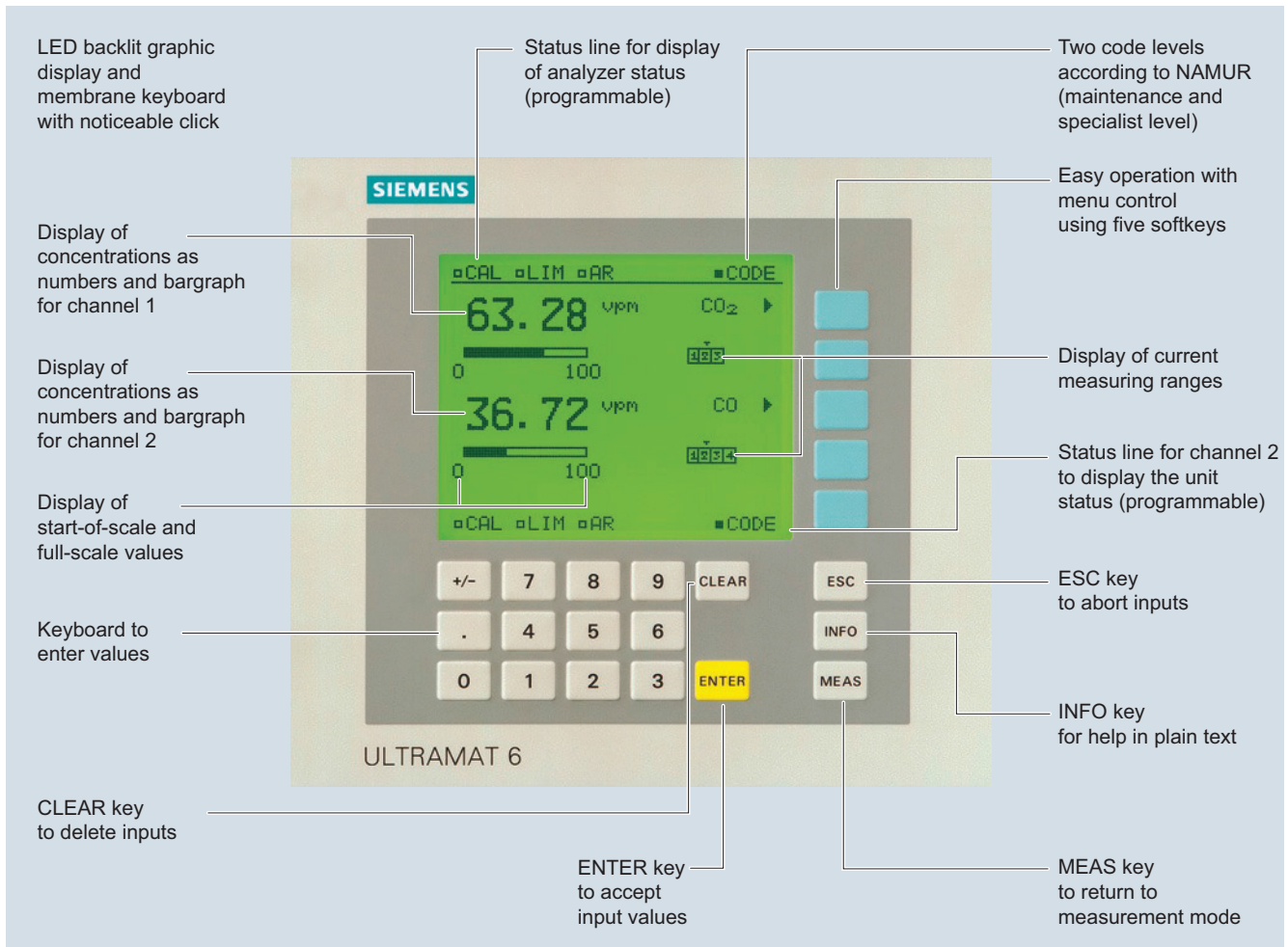
- Six binary inputs freely configurable (e.g. measurement range changeover, processing of external signals from the sample preparation)
- Six relay outputs freely configurable e.g. for fault, maintenance request, limit alarm, external solenoid valves)
- Expansion by eight additional binary inputs and eight additional relay outputs e.g. for autocalibration with up to four test gases

Communication

RS 485 present in the basic unit (connection at the rear; for the rack unit also behind the front plate).

Options

- AK interface for the automotive industry with extended functions
- RS 485/RS 232 converter
- RS 485/Ethernet converter
- RS 485/USB converter
- Connection to networks via PROFIBUS DP/PA interface
- SIPROM GA software as the service and maintenance tool



ULTRAMAT 6, membrane keyboard and graphic display

Designs – Parts wetted by sample gas, standard

Gas path		19" rack unit	Field device	Field device Ex
With hoses	Bushing	Stainless steel, mat. no. 1.4571		-
	Hose	FKM (e.g. Viton)		
With hoses	Sample chamber:			
	• Body	Aluminum		
	• Lining	Aluminum		
	• Fitting	Stainless steel, mat. no. 1.4571, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)		
	• Window	CaF ₂ , adhesive: E353, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)		
With pipes	Bushing	Titanium		
	Pipe	Titanium, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)		
	Sample chamber:			
	• Body	Aluminum		
	• Lining	Tantalum (only for cell length 20 mm to 180 mm)		
• Window	CaF ₂ , adhesive: E353, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)			
With pipes	Bushing	Stainless steel, mat. no. 1.4571		
	Pipe	Stainless steel, mat. no. 1.4571, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)		
	Sample chamber:			
	• Body	Aluminum		
	• Lining	Aluminum or tantalum (tantalum only for cell length 20 mm to 180 mm)		
• Window	CaF ₂ , adhesive: E353, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)			

Options

Gas path		19" rack unit	Field device	Field device Ex
Flow indicator	Measurement pipe	Duran glass	-	-
	Variable area	Duran glass		
	Suspension boundary	PTFE (Teflon)		
	Angle pieces	FKM (e.g. Viton)		
Pressure switch	Membrane	FKM (e.g. Viton)	-	-
	Enclosure	PA 6.3T		

Versions – Parts wetted by sample gas, special applications (examples)

Gas path		19" rack unit	Field device	Field device Ex
With pipes	Bushing	e.g. Hastelloy C22		
	Pipe	e.g. Hastelloy C22, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)		
	Sample chamber:			
	• Body	e.g. Hastelloy C22		
	• Window	CaF ₂ , without adhesive O-ring: FKM (e.g. Viton) or FFKM (Kalrez)		

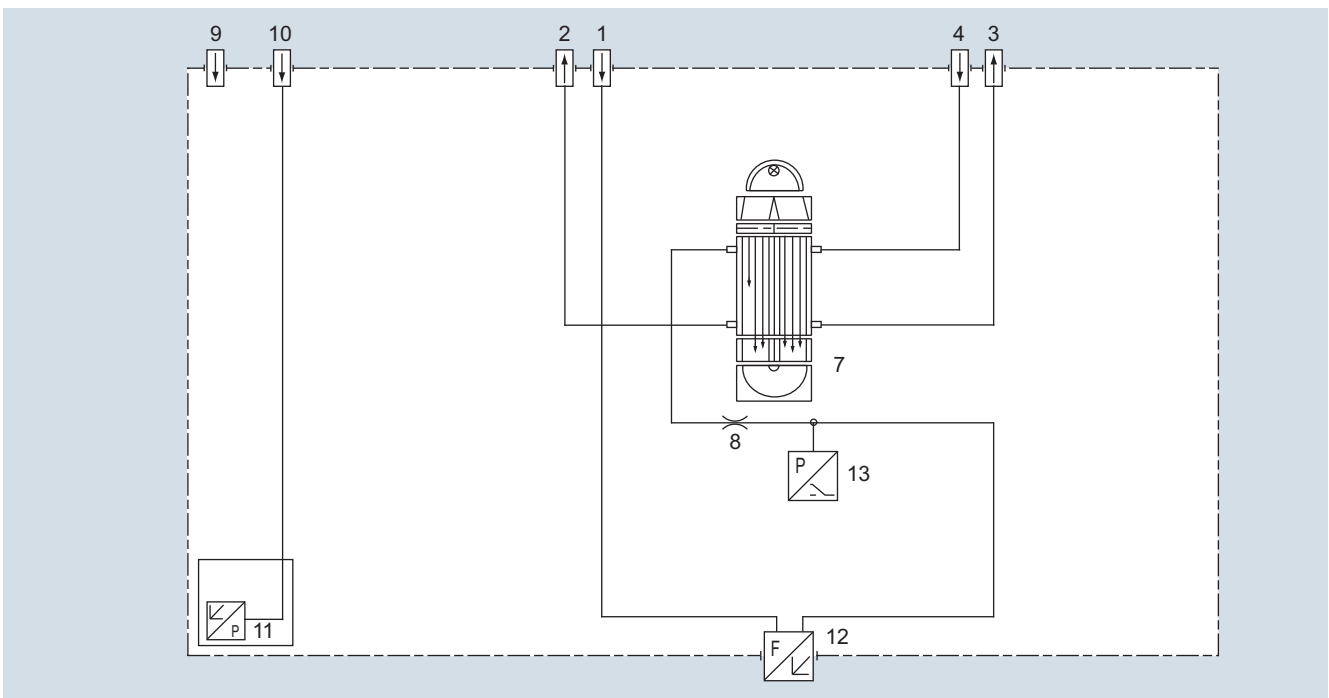
Continuous Gas Analyzers, extractive ULTRAMAT 6

General information

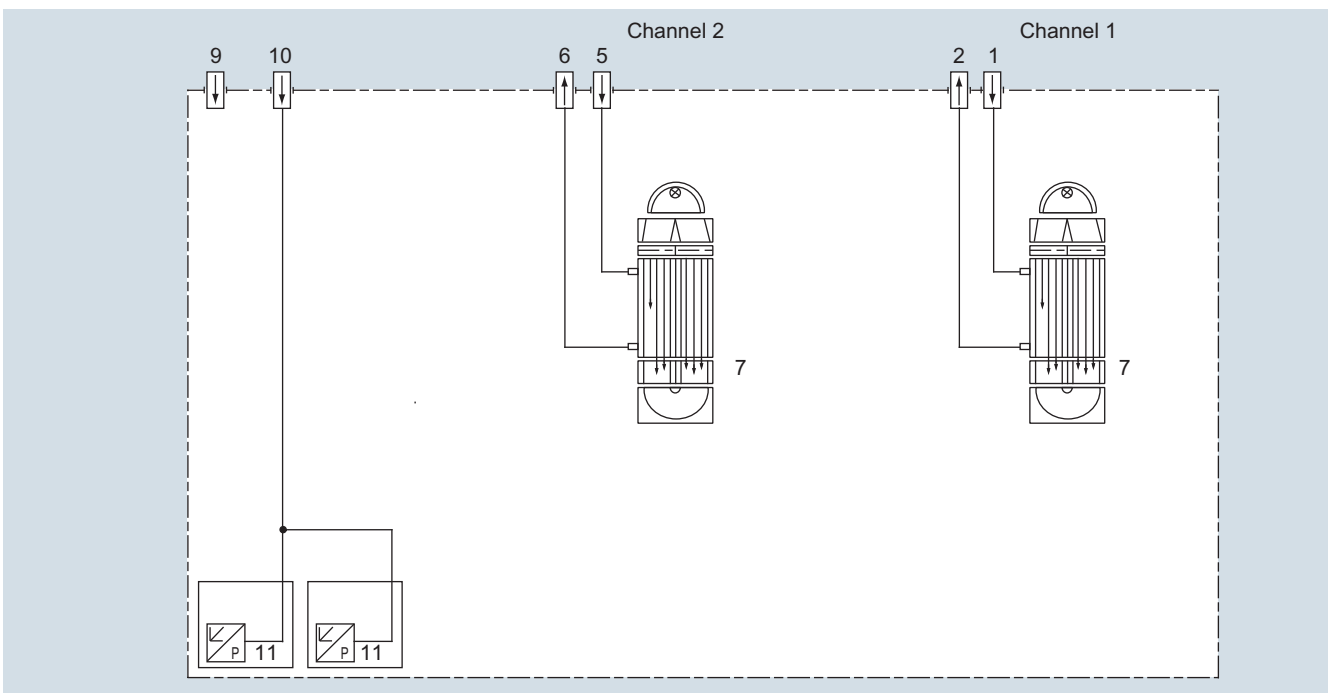
Gas path (19" rack unit)

Legend for the gas path figures

1	Sample gas inlet channel 1	8	Restrictor
2	Sample gas outlet channel 1	9	Purge gas inlet
3	Reference gas outlet (option)	10	Connection of atmospheric pressure sensor
4	Reference gas inlet (option)	11	Atmospheric pressure sensor
5	Sample gas inlet channel 2	12	Flow indicator in sample gas path (option)
6	Sample gas outlet channel 2	13	Pressure switch in sample gas path (option)
7	IR physical system		



Gas path ULTRAMAT 6, single-channel unit, 19" unit, with flow-type reference cell (option)

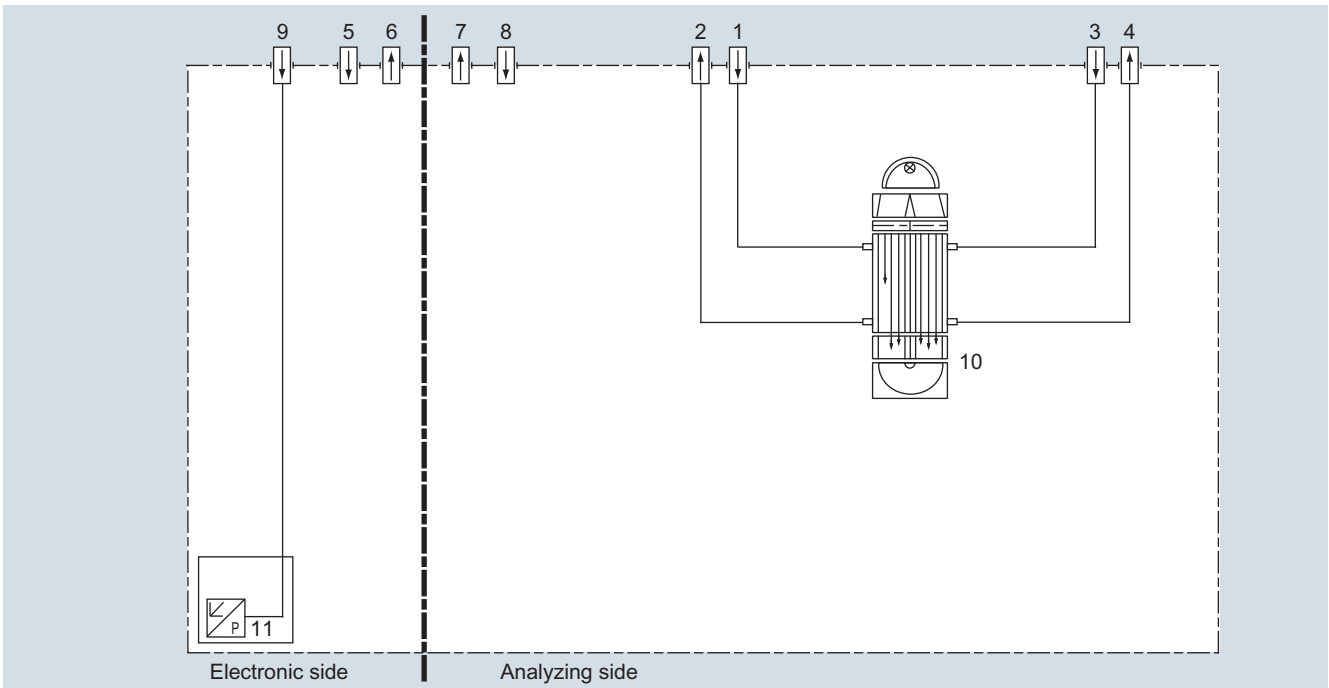


Gas path ULTRAMAT 6, dual-channel unit, 19" unit

Gas path (field device)

Legend for the gas path figures

1	Sample gas inlet	7	Purging gas outlet (analyzer side)
2	Sample gas outlet	8	Purging gas inlet (analyzer side)
3	Reference gas inlet (option)	9	Connection of atmospheric pressure sensor
4	Reference gas outlet (option)	10	IR physical system
5	Purging gas inlet (electronics side)	11	Atmospheric pressure sensor
6	Purging gas outlet (electronics side)		



Gas path ULTRAMAT 6, field unit, with flow-type reference cell (option)

Continuous Gas Analyzers, extractive ULTRAMAT 6

General information

Function

Principle of operation

The ULTRAMAT 6 gas analyzer operates according to the infrared two-beam alternating light principle with double-layer detector and optical coupler.

The measuring principle is based on the molecule-specific absorption of bands of infrared radiation. The absorbed wavelengths are characteristic to the individual gases, but may partially overlap. This results in cross-sensitivities which are reduced to a minimum in the ULTRAMAT 6 gas analyzers by the following measures:

- Gas-filled filter cell (beam divider)
- Double-layer detector with optical coupler
- Optical filters if necessary

The figure shows the measuring principle. An IR source (1) which is heated to approx. 700 °C and which can be shifted to balance the system is divided by the beam divider (3) into two equal beams (sample and reference beams). The beam divider also acts as a filter cell.

The reference beam passes through a reference cell (8) filled with N₂ (a non-infrared-active gas) and reaches the right-hand side of the detector (11) practically unattenuated. The sample beam passes through the sample chamber (7) through which the sample gas flows and reaches the left-hand side of the detector (10) attenuated to a lesser or greater extent depending on the concentration of the sample gas. The detector is filled with a defined concentration of the gas component to be measured.

The detector is designed as a double-layer detector. The center of the absorption band is preferentially absorbed in the upper detector layer, the edges of the band are absorbed to approximately the same extent in the upper and lower layers. The upper and lower detector layers are connected together via the microflow sensor (12). This coupling means that the spectral sensitivity has a very narrow band.

The optical coupler (13) lengthens the lower receiver cell layer optically. The infrared absorption in the second detector layer is varied by changing the slider position (14). It is thus possible to individually minimize the influence of interfering components.

A chopper (5) rotates between the beam divider and the sample chamber and interrupts the two beams alternately and periodically. If absorption takes place in the sample chamber, a pulsating flow is generated between the two detector levels which is converted by the microflow sensor (12) into an electric signal.

The microflow sensor consists of two nickel-plated grids heated to approximately 120 °C, which, along with two supplementary resistors, form a Wheatstone bridge. The pulsating flow together with the dense arrangement of the Ni grids causes a change in resistance. This leads to an offset in the bridge, which is dependent on the concentration of the sample gas.

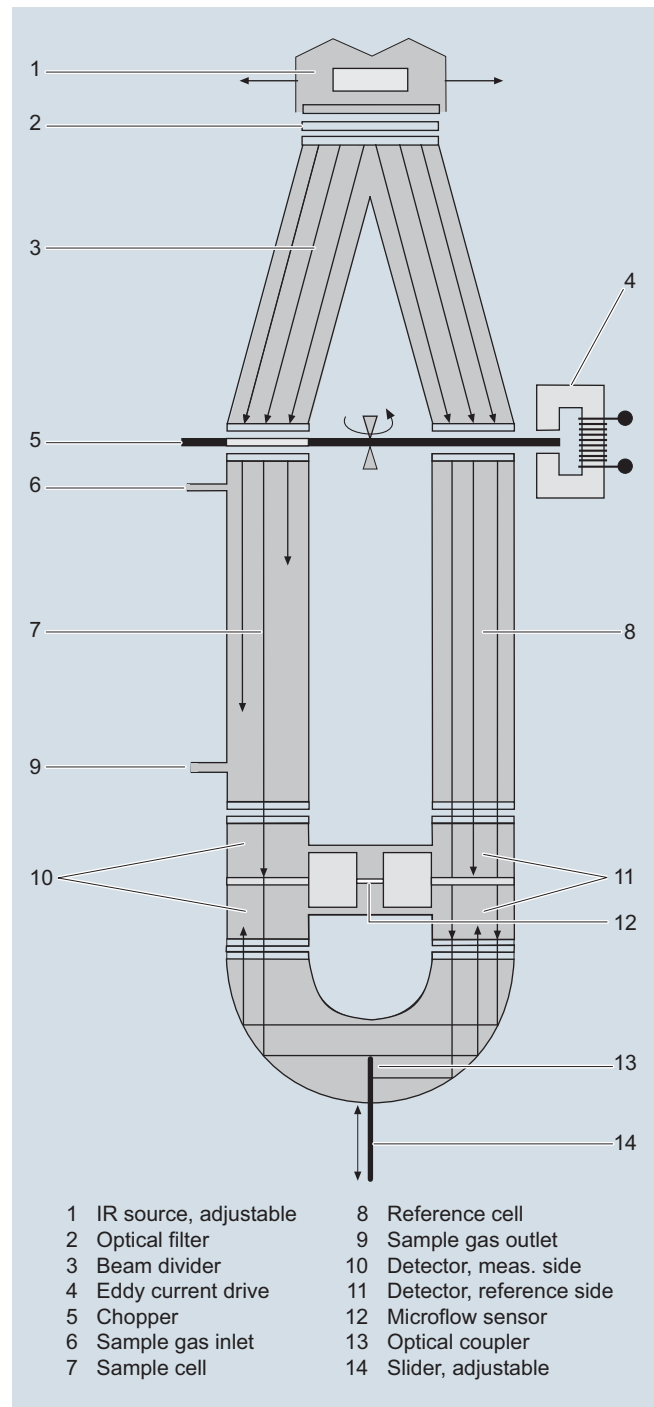
Notes

The sample gases must be fed into the analyzers free of dust. Condensation should be prevented from occurring in the sample chambers. Therefore, the use of gas modified for the measuring task is necessary in most application cases.

As far as possible, the ambient air of the analyzer should not have a large concentration of the gas components to be measured.

Flow-type reference sides with reduced flow must not be operated with flammable or toxic gases.

Flow-type reference sides with reduced flow and an O₂ content > 70 % may only be used together with Y02 (Clean for O₂).



ULTRAMAT 6, principle of operation

Channels with electronically suppressed zero point only differ from the standard version in the measuring range parameterization.

Physically suppressed zeros can be provided as a special application.

Essential characteristics

- Dimension of measured value freely selectable (e.g. vpm, mg/m³)
- Four freely-parameterizable measuring ranges per component
- Measuring ranges with suppressed zero point possible
- Measuring range identification
- Galvanically isolated signal output 0/2/4 to 20 mA per component
- Automatic or manual measuring range switchover selectable; remote switching is also possible
- Differential measuring ranges with flow-type reference cell
- Storage of measured values possible during adjustments
- Time constants selectable within wide limits (static/dynamic noise suppression); i.e. the response time of the analyzer or component can be matched to the respective measuring task
- Short response time
- Low long-term drift
- Measuring point switchover for up to 6 measuring points (programmable)
- Measuring point identification
- Monitoring of sample gas flow (option)
- Internal pressure sensor for correction of variations in atmospheric pressure in the range 700 to 1 200 hPa absolute
- External pressure sensor can be connected for correction of variations in the process gas pressure in the range 700 to 1 500 hPa absolute (option)
- Two control levels with separate authorization codes to prevent unintentional and unauthorized inputs
- Automatic, parameterizable measuring range calibration
- Simple handling using a numerical membrane keyboard and operator prompting
- Operation based on NAMUR recommendation
- Customer-specific analyzer options such as:
 - Customer acceptance
 - TAG labels
 - Drift recording
- Easy device replacement since electric connections can be simply disconnected from the device
- Sample chambers for use in presence of highly corrosive sample gases (e.g. tantalum layer or Hastelloy C22)

Additional features, dual-channel version

- Separate design of physical unit, electronics, inputs/outputs and power supply for each channel
- Display and operation via common LCD panel and keyboard
- Measurement channels 1 and 2 can be converted to series connection (linking of gas connections from channel 1 to channel 2 on rear)

Continuous Gas Analyzers, extractive

ULTRAMAT 6

19" rack unit

Technical specifications

General information

Measuring ranges	4, internally and externally switchable; autoranging is also possible
Smallest possible measuring range	Dependent on the application: e.g. CO: 0 ... 10 vpm, CO ₂ : 0 ... 5 vpm
Largest possible measuring span	Dependent on the application
Measuring range with suppressed zero point	Any zero point within 0 ... 100 vol.% can be implemented; smallest possible span 20 %
Operating position	Front wall, vertical
Conformity	CE mark in accordance with EN 50081-1, EN 50082-2
Influence of interfering gases must be considered separately	

Design, enclosure

Weight	Approx. 15 kg (with one IR channel) Approx. 21 kg (with two IR channels)
Degree of protection	IP20 according to EN 60529

Electrical characteristics

EMC (Electromagnetic Compatibility)	In accordance with standard requirements of NAMUR NE21 (08/98)
Electrical safety	According to EN 61010-1, overvoltage category III
Power supply	100 ... 120 V AC (nominal range of use 90 ... 132 V), 48 ... 63 Hz or 200 ... 240 V AC (nominal range of use 180 ... 264 V), 48 ... 63 Hz
Power consumption	1-channel unit: Approx. 40 VA 2-channel unit: Approx. 70 VA
Fuse values	
• 100 ... 120 V	1 T/250 (7MB2121) 1.6 T/250 (7MB2123)
• 200 ... 240 V	0.63 T/250 (7MB2121) 1 T/250 (7MB2123)

Gas inlet conditions

Permissible sample gas pressure	
• With hoses	
- Without pressure switch	600 ... 1 500 hPa (absolute)
- With pressure switch	700 ... 1 300 hPa (absolute)
• With pipes (without pressure switch)	600 ... 1 500 hPa (absolute)
Sample gas flow	18 ... 90 l/h (0.3 ... 1.5 l/min)
Sample gas temperature	Min. 0 ... max. 50 °C, but above the dew point
Sample gas humidity	< 90 % RH (relative humidity), or dependent on measuring task, non-condensing

Dynamic response

Warm-up period	At room temperature < 30 min (the technical specification will be met after 2 hours)
Delayed display (T ₉₀ -time)	Dependent on length of analyzer chamber, sample gas line and parameterizable damping
Damping (electrical time constant)	0 ... 100 s, parameterizable
Dead time (purging time of the gas path in the unit at 1 l/min)	Approximately 0.5 ... 5 s, depending on version
Time for device-internal signal processing	< 1 s

Pressure correction range

Pressure sensor	
• Internal	700 ... 1 200 hPa absolute
• External	700 ... 1 500 hPa absolute

Measuring response (relating to sample gas pressure 1 013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Output signal fluctuation	< ± 1 % of the smallest possible measuring range according to rating plate
Zero point drift	< ± 1 % of the current measuring range/week
Measured-value drift	< ± 1 % of the current measuring range/week
Repeatability	≤ 1 % of the current measuring range
Detection limit	1 % of the smallest possible measuring range
Linearity error	< 0.5 % of the full-scale value

Influencing variables (relating to sample gas pressure 1 013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Ambient temperature	< 1 % of current measuring range/10 K (with constant receiver cell temperature)
Sample gas pressure	<ul style="list-style-type: none"> • When pressure compensation has been switched on: < 0.15 % of the span/1 % change in atmospheric pressure • When pressure compensation has been switched off: < 1.5 % of the span/1 % change in atmospheric pressure
Sample gas flow	Negligible
Power supply	< 0.1 % of the current measuring range with rated voltage ± 10 %
Environmental conditions	Application-specific measuring influences possible if ambient air contains measured components or cross interference-sensitive gases

Electrical inputs and outputs

Analog output	0/2/4 ... 20 mA, isolated; load ≤ 750 Ω
Relay outputs	6, with changeover contacts, freely parameterizable, e.g. for measuring range identification; load: 24 V AC/DC/1 A, isolated, non-sparking
Analog inputs	2, dimensioned for 0/2/4 ... 20 mA for external pressure sensor and accompanying gas influence correction (correction of cross-interference)
Binary inputs	6, designed for 24 V, isolated, freely parameterizable, e.g. for measuring range switchover
Serial interface	RS 485
Options	AUTOCAL function with 8 additional binary inputs and relay outputs, also with PROFIBUS PA or PROFIBUS DP

Climatic conditions

Permissible ambient temperature	-30 ... +70 °C during storage and transportation, 5 ... 45 °C during operation
Permissible humidity	< 90 % RH (relative humidity) as annual average, during storage and transportation (dew point must not be undershot)

Selection and ordering data

Article No.

ULTRAMAT 6 gas analyzer

7MB2121- - - - - AA

Cannot be combined

Single-channel 19" rack unit for installation in cabinets

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Gas connections for sample gas and reference gas

Pipe with 6 mm outer diameter

Pipe with 1/4" outer diameter

0
1

0 → A21
1 → A20

<u>Measured component</u>	<u>Possible with measuring range identification</u>
---------------------------	---

CO	11 ... 30
CO highly selective (with optical filter)	12 ... 30
CO (TÜV; see table "TÜV single component", page 1/57)	
CO ₂	10 ... 30
CH ₄	13 ... 30
C ₂ H ₂	15 ... 30
C ₂ H ₄	15 ... 30
C ₂ H ₆	14 ... 30
C ₃ H ₆	14 ... 30
C ₃ H ₈	13 ... 30
C ₄ H ₆	15 ... 30
C ₄ H ₁₀	14 ... 30
C ₆ H ₁₄	14 ... 30
SO ₂ (TÜV; see table "TÜV single component", page 1/57)	13 ... 30
NO (TÜV; see table "TÜV single component", page 1/57)	14 ... 20, 22
NH ₃ (dry)	14 ... 30
H ₂ O	17 ... 20, 22
N ₂ O	13 ... 30

A
B
X
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S

Q
R

<u>Smallest measuring range</u>	<u>Largest measuring range</u>	<u>Measuring range identification</u>
---------------------------------	--------------------------------	---------------------------------------

0 ... 5 vpm	0 ... 100 vpm	10
0 ... 10 vpm	0 ... 200 vpm	11
0 ... 20 vpm	0 ... 400 vpm	12
0 ... 50 vpm	0 ... 1 000 vpm	13
0 ... 100 vpm	0 ... 1 000 vpm	14
0 ... 300 vpm	0 ... 3 000 vpm	15
0 ... 500 vpm	0 ... 5 000 vpm	16
0 ... 1 000 vpm	0 ... 10 000 vpm	17
0 ... 3 000 vpm	0 ... 10 000 vpm	18
0 ... 3 000 vpm	0 ... 30 000 vpm	19
0 ... 5 000 vpm	0 ... 15 000 vpm	20
0 ... 5 000 vpm	0 ... 50 000 vpm	21
0 ... 1 %	0 ... 3 %	22
0 ... 1 %	0 ... 10 %	23
0 ... 3 %	0 ... 10 %	24
0 ... 3 %	0 ... 30 %	25
0 ... 5 %	0 ... 15 %	26
0 ... 5 %	0 ... 50 %	27
0 ... 10 %	0 ... 30 %	28
0 ... 10 %	0 ... 100 %	29
0 ... 30 %	0 ... 100 %	30

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
W

<u>Internal gas paths</u>	<u>Sample chamber¹⁾ (lining)</u>	<u>Reference chamber (flow-type)</u>
---------------------------	---	--------------------------------------

Hose made of FKM (Viton)	Aluminum	Non-flow-type
	Aluminum	Flow-type
Pipe made of titanium	Tantalum	Non-flow-type
	Tantalum	Flow-type
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type
	Tantalum	Non-flow-type

0
1
4
5
6
8
2
3

0 → A20, A21
1
4 → A20, A21, Y02
5 → Y02
6 → A20, A21
8 → A20, A21
2 → A20, A21
3

With sample gas monitoring

Hose made of FKM (Viton)	Aluminum	Non-flow-type
	Aluminum	Flow-type

Footnotes: see next page

Continuous Gas Analyzers, extractive

ULTRAMAT 6

19" rack unit

Selection and ordering data	Article No.	
ULTRAMAT 6 gas analyzer Single-channel 19" rack unit for installation in cabinets	7MB2121-	Cannot be combined
<u>Add-on electronics</u> Without AUTOCAL function <ul style="list-style-type: none"> • With 8 additional digital inputs/outputs • With serial interface for the automotive industry (AK) • With 8 digital inputs/outputs, PROFIBUS PA interface • With 8 digital inputs/outputs, PROFIBUS DP interface 	0 1 3 6 7	3 → E20
<u>Power supply</u> 100 ... 120 V AC, 48 ... 63 Hz 200 ... 240 V AC, 48 ... 63 Hz	0 1	
<u>Operating software and documentation</u> German English French Spanish Italian	0 1 2 3 4	
Additional versions	Order code	
Add "-Z" to Article No. and specify Order code		
Flow-type reference cell with reduced flow, 6 mm	A20	
Flow-type reference cell with reduced flow, 1/4"	A21	
Telescopic rails (2 units)	A31	
TAG labels (specific lettering based on customer information)	B03	
Kalrez gaskets in sample gas path	B04	
SIL conformity declaration (SIL 2) Functional Safety according to IEC 61508 and IEC 61511	C20	
FM/CSA certificate – Class I Div 2	E20	
Clean for O ₂ service (specially cleaned gas path)	Y02	
Measuring range indication in plain text, if different from the standard setting	Y11	
Special setting (only in conjunction with an application no., e.g. extended measuring range)	Y12	
Extended special setting (only in conjunction with an application no., e.g. determination of cross-interferences)	Y13	
TÜV version acc. to 13th and 17th BImSchV	Y17	
Accessories	Article No.	
RS 485/Ethernet converter	A5E00852383	
RS 485/RS 232 converter	C79451-Z1589-U1	
RS 485/USB converter	A5E00852382	
AUTOCAL function with serial interface for the automotive industry (AK)	C79451-A3480-D512	
AUTOCAL function with 8 digital inputs/outputs	C79451-A3480-D511	
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA	A5E00057307	
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS DP	A5E00057312	
Set of Torx screwdrivers	A5E34821625	

¹⁾ Only for cell length 20 to 180 mm

Selection and ordering data			Article No.	
ULTRAMAT 6 gas analyzer			7MB2123- - - - -	
Two-channel 19" rack unit for installation in cabinets for measuring 2 IR components			Cannot be combined	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
<u>Gas connections for sample gas and reference gas</u>				
Pipe with 6 mm outer diameter			0	0 → A21, A41
Pipe with 1/4" outer diameter			1	1 → A20, A40
<u>Channel 1</u>				
<u>Measured component</u>	<u>Possible with measuring range</u>	<u>Identification</u>		
CO	11 ... 30	A		
CO highly selective (with optical filter)	12 ... 30	B		
CO (TÜV; see table "TÜV single component", page 1/57)		X		
CO ₂	10 ... 30	C		
CH ₄	13 ... 30	D		
C ₂ H ₂	15 ... 30	E		
C ₂ H ₄	15 ... 30	F		
C ₂ H ₆	14 ... 30	G		
C ₃ H ₆	14 ... 30	H		
C ₃ H ₈	13 ... 30	J		
C ₄ H ₆	15 ... 30	K		
C ₄ H ₁₀	14 ... 30	L		
C ₆ H ₁₄	14 ... 30	M		
SO ₂ (TÜV; see table "TÜV single component", page 1/57)	13 ... 30	N		
NO (TÜV; see table "TÜV single component", page 1/57)	14 ... 20, 22	P		
NH ₃ (dry)	14 ... 30	Q	Q	
H ₂ O	17 ... 20, 22	R	R	
N ₂ O	13 ... 30	S		
<u>Smallest measuring range</u>	<u>Largest measuring range</u>	<u>Measuring range identification</u>		
0 ... 5 vpm	0 ... 100 vpm	10	A	
0 ... 10 vpm	0 ... 200 vpm	11	B	
0 ... 20 vpm	0 ... 400 vpm	12	C	
0 ... 50 vpm	0 ... 1 000 vpm	13	D	
0 ... 100 vpm	0 ... 1 000 vpm	14	E	
0 ... 300 vpm	0 ... 3 000 vpm	15	F	
0 ... 500 vpm	0 ... 5 000 vpm	16	G	
0 ... 1 000 vpm	0 ... 10 000 vpm	17	H	
0 ... 3 000 vpm	0 ... 10 000 vpm	18	J	
0 ... 3 000 vpm	0 ... 30 000 vpm	19	K	
0 ... 5 000 vpm	0 ... 15 000 vpm	20	L	
0 ... 5 000 vpm	0 ... 50 000 vpm	21	M	
0 ... 1 %	0 ... 3 %	22	N	
0 ... 1 %	0 ... 10 %	23	P	
0 ... 3 %	0 ... 10 %	24	Q	
0 ... 3 %	0 ... 30 %	25	R	
0 ... 5 %	0 ... 15 %	26	S	
0 ... 5 %	0 ... 50 %	27	T	
0 ... 10 %	0 ... 30 %	28	U	
0 ... 10 %	0 ... 100 %	29	V	
0 ... 30 %	0 ... 100 %	30	W	
<u>Internal gas paths</u>	<u>Sample chamber¹⁾ (lining)</u>	<u>Reference chamber (flow-type)</u>		
Hose made of FKM (Viton)	Aluminum	Non-flow-type	0	0 → A20, A21, A40, A41
	Aluminum	Flow-type	1	1
Pipe made of titanium	Tantalum	Non-flow-type	4	4 → A20, A21, A40, A41, Y02
	Tantalum	Flow-type	5	5 → Y02
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type	6	6 → A20, A21, A40, A41
	Tantalum	Non-flow-type	8	8 → A20, A21, A40, A41
<u>With sample gas monitoring</u>				
Hose made of FKM (Viton)	Aluminum	Non-flow-type	2	2 → A20, A21, A40, A41
	Aluminum	Flow-type	3	3

1) Only for cell length 20 to 180 mm

Continuous Gas Analyzers, extractive ULTRAMAT 6

19" rack unit

1

Selection and ordering data

Article No.

ULTRAMAT 6 gas analyzer

Two-channel 19" rack unit for installation in cabinets for measuring 2 IR components

7MB2123- - - - -

Cannot be combined

Add-on electronics

Without

AUTOCAL function

- With 8 additional digital inputs/outputs each for channel 1
- With 8 additional digital inputs/outputs each for channel 2
- With 8 additional digital inputs/outputs each for channel 1 and channel 2
- With serial interface for the automotive industry (AK)
- With 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS PA interface
- With 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS DP interface

0

1

2

3

5

6

7

5 → E20

Power supply

100 ... 120 V AC, 48 ... 63 Hz

200 ... 240 V AC, 48 ... 63 Hz

0

1

Channel 2

Measured component

Possible with measuring range identification

CO	11 ... 30
CO highly selective (with optical filter)	12 ... 30
CO (TÜV; see table "TÜV single component", page 1/57)	
CO ₂	10 ... 30
CH ₄	13 ... 30
C ₂ H ₂	15 ... 30
C ₂ H ₄	15 ... 30
C ₂ H ₆	14 ... 30
C ₃ H ₆	14 ... 30
C ₃ H ₈	13 ... 30
C ₄ H ₆	15 ... 30
C ₄ H ₁₀	14 ... 30
C ₆ H ₁₄	14 ... 30
SO ₂ (TÜV; see table "TÜV single component", page 1/57)	13 ... 30
NO (TÜV; see table "TÜV single component", page 1/57)	14 ... 20, 22
NH ₃ (dry)	14 ... 30
H ₂ O	17 ... 20, 22
N ₂ O	13 ... 30

A

B

X

C

D

E

F

G

H

J

K

L

M

N

P

Q

R

S

Q

R

Smallest measuring range

Largest measuring range

Measuring range identification

0 ... 5 vpm	0 ... 100 vpm	10
0 ... 10 vpm	0 ... 200 vpm	11
0 ... 20 vpm	0 ... 400 vpm	12
0 ... 50 vpm	0 ... 1 000 vpm	13
0 ... 100 vpm	0 ... 1 000 vpm	14
0 ... 300 vpm	0 ... 3 000 vpm	15
0 ... 500 vpm	0 ... 5 000 vpm	16
0 ... 1 000 vpm	0 ... 10 000 vpm	17
0 ... 3 000 vpm	0 ... 10 000 vpm	18
0 ... 3 000 vpm	0 ... 30 000 vpm	19
0 ... 5 000 vpm	0 ... 15 000 vpm	20
0 ... 5 000 vpm	0 ... 50 000 vpm	21
0 ... 1 %	0 ... 3 %	22
0 ... 1 %	0 ... 10 %	23
0 ... 3 %	0 ... 10 %	24
0 ... 3 %	0 ... 30 %	25
0 ... 5 %	0 ... 15 %	26
0 ... 5 %	0 ... 50 %	27
0 ... 10 %	0 ... 30 %	28
0 ... 10 %	0 ... 100 %	29
0 ... 30 %	0 ... 100 %	30

A

B

C

D

E

F

G

H

J

K

L

M

N

P

Q

R

S

T

U

V

W

Operating software and documentation

German

English

French

Spanish

Italian

0

1

2

3

4

Selection and ordering data

<i>Additional versions</i>	Order code	Cannot be combined
Add "-Z" to Article No. and specify Order codes.		
Flow-type reference cell with reduced flow, 6 mm (channel 1)	A20	
Flow-type reference cell with reduced flow, 1/4" (channel 1)	A21	
Flow-type reference cell with reduced flow, 6 mm (channel 2)	A40	
Flow-type reference cell with reduced flow, 1/4" (channel 2)	A41	
Connection pipe (can only be combined with the appropriate gas connection diameter and internal gas path materials)		
• Made of titanium, 6 mm, complete with screwed gland, for sample gas side	A22	
• Made of titanium, 6 mm, complete with screwed gland, for reference gas side	A23	
• Made of titanium, 1/4", complete with screwed gland, for sample gas side	A24	
• Made of titanium, 1/4", complete with screwed gland, for reference gas side	A25	
• Made of stainless steel (mat. no. 1.4571), 6 mm, complete with screwed gland, for sample gas side	A27	
• Made of stainless steel (mat. no. 1.4571), 1/4", complete with screwed gland, for sample gas side	A29	
Telescopic rails (2 units)	A31	
TAG labels (specific lettering based on customer information)	B03	
Kalrez gaskets in sample gas path (channel 1)	B04	
Kalrez gaskets in sample gas path (channel 2)	B05	
SIL conformity declaration (SIL 2) Functional Safety according to IEC 61508 and IEC 61511	C20	
FM/CSA certificate – Class I Div 2	E20	
Clean for O ₂ service (specially cleaned gas path; channels 1 + 2)	Y02	
Measuring range indication in plain text, if different from the standard setting	Y11	
Special setting (only in conjunction with an application no., e.g. extended measuring range)	Y12	
Extended special setting (only in conjunction with an application no., e.g. determination of cross-interferences)	Y13	
TÜV version acc. to 13th and 17th BImSchV (1st channel)	Y17	
TÜV version acc. to 13th and 17th BImSchV (2nd channel)	Y18	
Accessories	Article No.	
RS 485/Ethernet converter	A5E00852383	
RS 485/RS 232 converter	C79451-Z1589-U1	
RS 485/USB converter	A5E00852382	
AUTOCAL function with serial interface for the automotive industry (AK)	C79451-A3480-D33	
AUTOCAL function with 8 digital inputs/outputs for channel 1 or channel 2	C79451-A3480-D511	
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA for channel 1 or channel 2	A5E00057307	
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS DP for channel 1 or channel 2	A5E00057312	
Set of Torx screwdrivers	A5E34821625	

Continuous Gas Analyzers, extractive ULTRAMAT 6

19" rack unit

1

Selection and ordering data

Article No.

ULTRAMAT 6 gas analyzer



7MB2124-

Cannot be combined

Single-channel or dual-channel 19" rack unit for installation in cabinets for measuring 2 or 3 IR components

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Gas connections for sample gas and reference gas

Pipe with 6 mm outer diameter

Pipe with 1/4" outer diameter

0

0 → A21, A41

1

1 → A20, A40

Measured component	Smallest measuring range	Largest measuring range
--------------------	--------------------------	-------------------------

CO	0 ... 100 vpm	0 ... 1 000 vpm	A A
NO	0 ... 100 vpm	0 ... 1 000 vpm	
CO	0 ... 300 vpm	0 ... 3 000 vpm	A B
NO	0 ... 300 vpm	0 ... 3 000 vpm	
CO	0 ... 1 000 vpm	0 ... 10 000 vpm	A C
NO	0 ... 1 000 vpm	0 ... 10 000 vpm	

For CO/NO (TÜV; table "TÜV, 2 components in series", page 1/57)

CO ₂	0 ... 100 vpm	0 ... 1 000 vpm	B A
CO	0 ... 100 vpm	0 ... 1 000 vpm	
CO ₂	0 ... 300 vpm	0 ... 3 000 vpm	B B
CO	0 ... 300 vpm	0 ... 3 000 vpm	
CO ₂	0 ... 1 000 vpm	0 ... 10 000 vpm	B C
CO	0 ... 1 000 vpm	0 ... 10 000 vpm	
CO ₂	0 ... 3 000 vpm	0 ... 30 000 vpm	B D
CO	0 ... 3 000 vpm	0 ... 30 000 vpm	
CO ₂	0 ... 1 %	0 ... 10 %	B E
CO	0 ... 1 %	0 ... 10 %	
CO ₂	0 ... 3 %	0 ... 30 %	B F
CO	0 ... 3 %	0 ... 30 %	
CO ₂	0 ... 10 %	0 ... 100 %	B G
CO	0 ... 10 %	0 ... 100 %	
CO ₂	0 ... 10 %	0 ... 100 %	C G
CH ₄	0 ... 10 %	0 ... 100 %	
CO ₂	0 ... 300 vpm	0 ... 3 000 vpm	D B
NO	0 ... 300 vpm	0 ... 3 000 vpm	

Internal gas paths	Sample chamber ¹⁾ (lining)	Reference chamber (flow-type)
--------------------	---------------------------------------	-------------------------------

Hose made of FKM (Viton)	Aluminum	Non-flow-type	0
	Aluminum	Flow-type	1

Pipe made of titanium	Tantalum	Non-flow-type	4
	Tantalum	Flow-type	5

Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type	6
	Tantalum	Non-flow-type	8

With sample gas monitoring

Hose made of FKM (Viton)	Aluminum	Non-flow-type	2
	Aluminum	Flow-type	3

Add-on electronics

Without

AUTOCAL function

- With 8 additional digital inputs/outputs each for channel 1
- With 8 additional digital inputs/outputs each for channel 1 and channel 2
- With serial interface for the automotive industry (AK), channel 1
- With serial interface for the automotive industry (AK), channel 1 and channel 2
- With 8 additional digital inputs/outputs for channel 1 and PROFIBUS PA interface
- With 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS PA interface
- With 8 additional digital inputs/outputs for channel 1 and PROFIBUS DP interface
- With 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS DP interface

0

1

2

3

4

5

6

7

8

0 0 → A20, A21, A40, A41

1

4 → A20, A21, A40, A41, Y02

5 → Y02

6 → A20, A21, A40, A41

8 → A20, A21, A40, A41

2 2 → A20, A21, A40, A41

3

2




3 → E20

4 → E20

6

8

¹⁾ Only for cell length 20 to 180 mm

Selection and ordering data			Article No.	
ULTRAMAT 6 gas analyzer Single-channel or dual-channel 19" rack unit for installation in cabinets for measuring 2 or 3 IR components			7MB2124-  -  Cannot be combined	
<u>Power supply</u> 100 ... 120 V AC, 48 ... 63 Hz 200 ... 240 V AC, 48 ... 63 Hz				
<u>Channel 2</u>				
<u>Measured component</u>		<u>Possible with measuring range identification</u>		
Without channel 2				
CO		11 ... 30		
CO highly selective (with optical filter)		12 ... 30		
CO (TÜV; see table "TÜV single component", page 1/57)				
CO ₂		10 ... 30		
CH ₄		13 ... 30		
C ₂ H ₂		15 ... 30		
C ₂ H ₄		15 ... 30		
C ₂ H ₆		14 ... 30		
C ₃ H ₆		14 ... 30		
C ₃ H ₈		13 ... 30		
C ₄ H ₆		15 ... 30		
C ₄ H ₁₀		14 ... 30		
C ₆ H ₁₄		14 ... 30		
SO ₂ (TÜV; see table "TÜV single component", page 1/57)		13 ... 30		
NO (TÜV; see table "TÜV single component", page 1/57)		14 ... 20, 22		
NH ₃ (dry)		14 ... 30		
H ₂ O		17 ... 20, 22		
N ₂ O		13 ... 30		
<u>Smallest measuring range</u>	<u>Largest measuring range</u>	<u>Measuring range identification</u>		
Without channel 2				
0 ... 5 vpm	0 ... 100 vpm	10		
0 ... 10 vpm	0 ... 200 vpm	11		
0 ... 20 vpm	0 ... 400 vpm	12		
0 ... 50 vpm	0 ... 1 000 vpm	13		
0 ... 100 vpm	0 ... 1 000 vpm	14		
0 ... 300 vpm	0 ... 3 000 vpm	15		
0 ... 500 vpm	0 ... 5 000 vpm	16		
0 ... 1 000 vpm	0 ... 10 000 vpm	17		
0 ... 3 000 vpm	0 ... 10 000 vpm	18		
0 ... 3 000 vpm	0 ... 30 000 vpm	19		
0 ... 5 000 vpm	0 ... 15 000 vpm	20		
0 ... 5 000 vpm	0 ... 50 000 vpm	21		
0 ... 1 %	0 ... 3 %	22		
0 ... 1 %	0 ... 10 %	23		
0 ... 3 %	0 ... 10 %	24		
0 ... 3 %	0 ... 30 %	25		
0 ... 5 %	0 ... 15 %	26		
0 ... 5 %	0 ... 50 %	27		
0 ... 10 %	0 ... 30 %	28		
0 ... 10 %	0 ... 100 %	29		
0 ... 30 %	0 ... 100 %	30		
<u>Operating software and documentation</u>				
German			0	
English			1	
French			2	
Spanish			3	
Italian			4	

Cannot be combined

0
1
W
A
B
X
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
X
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
W

W

Q
R

X → A40, A41, B05

Continuous Gas Analyzers, extractive

ULTRAMAT 6

19" rack unit

Selection and ordering data

Additional versions

	Order code	Cannot be combined
Add "-Z" to Article No. and specify Order codes.		
Flow-type reference cell with reduced flow, 6 mm (channel 1)	A20	
Flow-type reference cell with reduced flow, 1/4" (channel 1)	A21	
Flow-type reference cell with reduced flow, 6 mm (channel 2)	A40	
Flow-type reference cell with reduced flow, 1/4" (channel 2)	A41	
Connection pipe (can only be combined with the appropriate gas connection diameter and internal gas path materials)		
• Made of titanium, 6 mm, complete with screwed gland, for sample gas side	A22	
• Made of titanium, 6 mm, complete with screwed gland, for reference gas side	A23	
• Made of titanium, 1/4", complete with screwed gland, for sample gas side	A24	
• Made of titanium, 1/4", complete with screwed gland, for reference gas side	A25	
• Made of stainless steel (mat. no. 1.4571), 6 mm, complete with screwed gland, for sample gas side	A27	
• Made of stainless steel (mat. no. 1.4571), 1/4", complete with screwed gland, for sample gas side	A29	
Telescopic rails (2 units)	A31	
TAG labels (specific lettering based on customer information)	B03	
Kalrez gaskets in sample gas path (channel 1)	B04	
Kalrez gaskets in sample gas path (channel 2)	B05	
SIL conformity declaration (SIL 2) Functional Safety according to IEC 61508 and IEC 61511	C20	
FM/CSA certificate – Class I Div 2	E20	
Clean for O ₂ service (specially cleaned gas path; channels 1 + 2)	Y02	
Measuring range indication in plain text, if different from the standard setting	Y11	
Special setting (only in conjunction with an application no., e.g. extended measuring range)	Y12	
Extended special setting (only in conjunction with an application no., e.g. determination of cross-interferences)	Y13	
TÜV version acc. to 13th and 17th BImSchV (channel 1)	Y17	
TÜV version acc. to 13th and 17th BImSchV (channel 2)	Y18	

Accessories

	Article No.	Cannot be combined
RS 485/Ethernet converter	A5E00852383	
RS 485/RS 232 converter	C79451-Z1589-U1	
RS 485/USB converter	A5E00852382	
AUTOCAL function with serial interface for the automotive industry (AK)	C79451-A3480-D33	
AUTOCAL function with 8 digital inputs/outputs for channel 1 or channel 2	C79451-A3480-D511	
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA for channel 1 or channel 2	A5E00057307	
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS DP for channel 1 or channel 2	A5E00057312	
Set of Torx screwdrivers	A5E34821625	

TÜV single component

Component Measuring range identification	CO (TÜV)		SO ₂ (TÜV)		NO (TÜV)	
	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...
C			75 mg/m ³	1 500 mg/m ³		
D	50 mg/m ³	1 000 mg/m ³	300 mg/m ³	3 000 mg/m ³		
E			500 mg/m ³	5 000 mg/m ³	100 mg/m ³	2 000 mg/m ³
F	300 mg/m ³	3 000 mg/m ³	1 000 mg/m ³	10 000 mg/m ³	300 mg/m ³	3 000 mg/m ³
G	500 mg/m ³	5 000 mg/m ³			500 mg/m ³	5 000 mg/m ³
H	1 000 mg/m ³	10 000 mg/m ³	3 000 mg/m ³	30 000 mg/m ³	1 000 mg/m ³	10 000 mg/m ³
K	3 000 mg/m ³	30 000 mg/m ³	10 g/m ³	100 g/m ³	3 000 mg/m ³	30 000 mg/m ³
P	10 g/m ³	100 g/m ³	30 g/m ³	300 g/m ³	10 g/m ³	100 g/m ³
R	30 g/m ³	300 g/m ³	100 g/m ³	1 000 g/m ³	30 g/m ³	300 g/m ³
V	100 g/m ³	1 160 g/m ³	300 g/m ³	2 630 g/m ³	100 g/m ³	1 250 g/m ³

Example for ordering

ULTRAMAT 6, TÜV

Component: CO

Measuring range: 0 to 50 / 1 000 mg/m³

with hoses, non-flow-type reference compartment

without automatic adjustment (AUTOCAL)

230 V AC; German

7MB2121-0XD00-1AA0-Z +Y17**TÜV, 2 components in series**

Component Measuring range identification	CO (TÜV)		NO (TÜV)	
	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...
AA	75 mg/m ³	1 000 mg/m ³	200 mg/m ³	2 000 mg/m ³
AB	300 mg/m ³	3 000 mg/m ³	300 mg/m ³	3 000 mg/m ³
AC	1 000 mg/m ³	10 000 mg/m ³	1 000 mg/m ³	10 000 mg/m ³

Example for ordering

ULTRAMAT 6, TÜV, 2-component unit

Components: CO/NO + SO₂Measuring range: CO: 0 to 75 / 1 000 mg/m³, NO: 0 to 200 / 2 000 mg/m³, SO₂: 0 to 75 / 1 500 mg/m³

with hoses, non-flow-type reference compartment

without automatic adjustment (AUTOCAL)

230 V AC; German

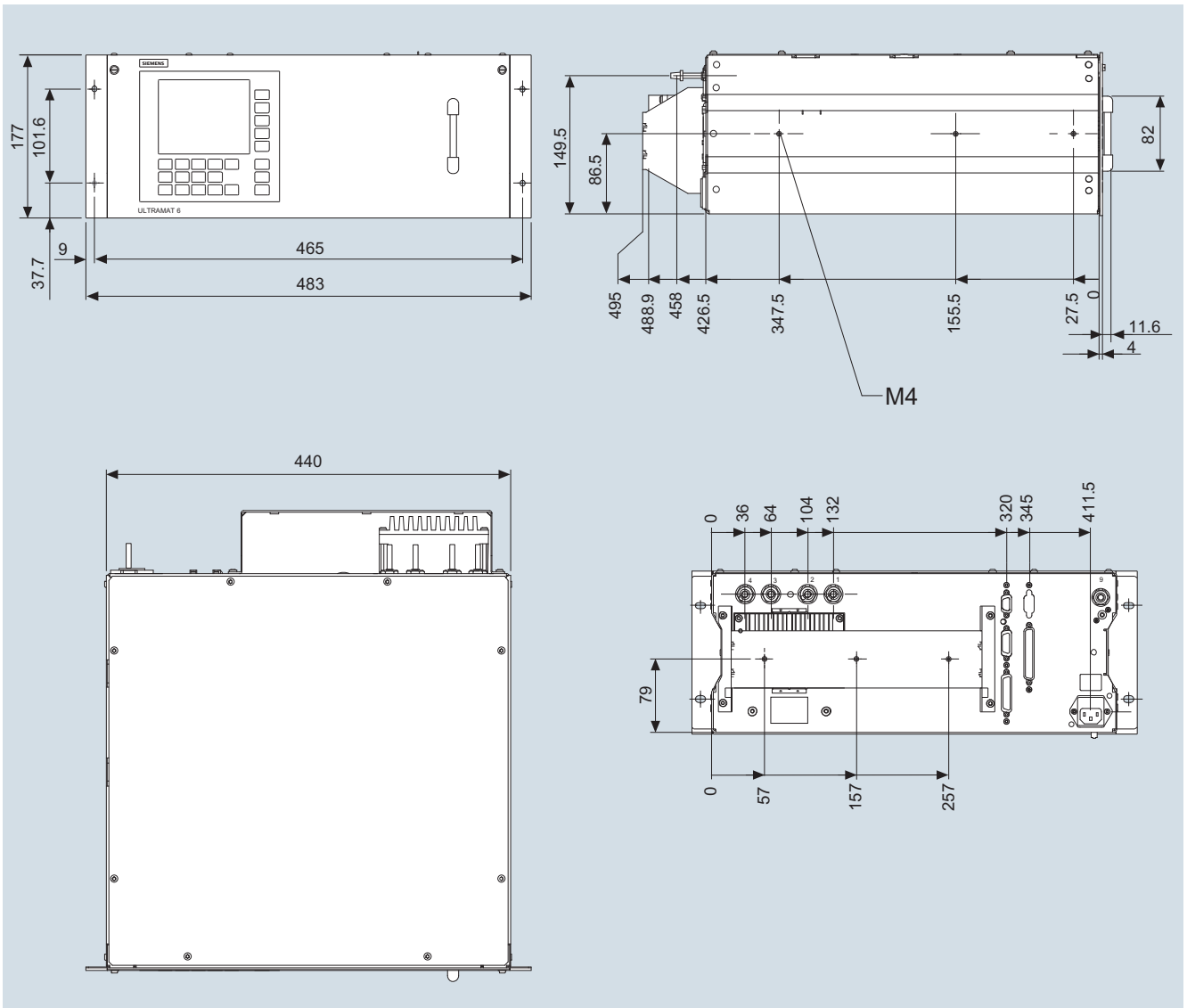
7MB2124-0AA00-1NC0-Z +Y17+Y18**Note:** for 3 components take both tables into consideration.Ordering information measured component N₂OCertification in accordance with AM0028 and AM0034 (Kyoto Protocol) for measuring N₂O, measuring range 0 ... 300 vpm / 3 000 vpm.

Version: Standard device

Continuous Gas Analyzers, extractive ULTRAMAT 6

19" rack unit

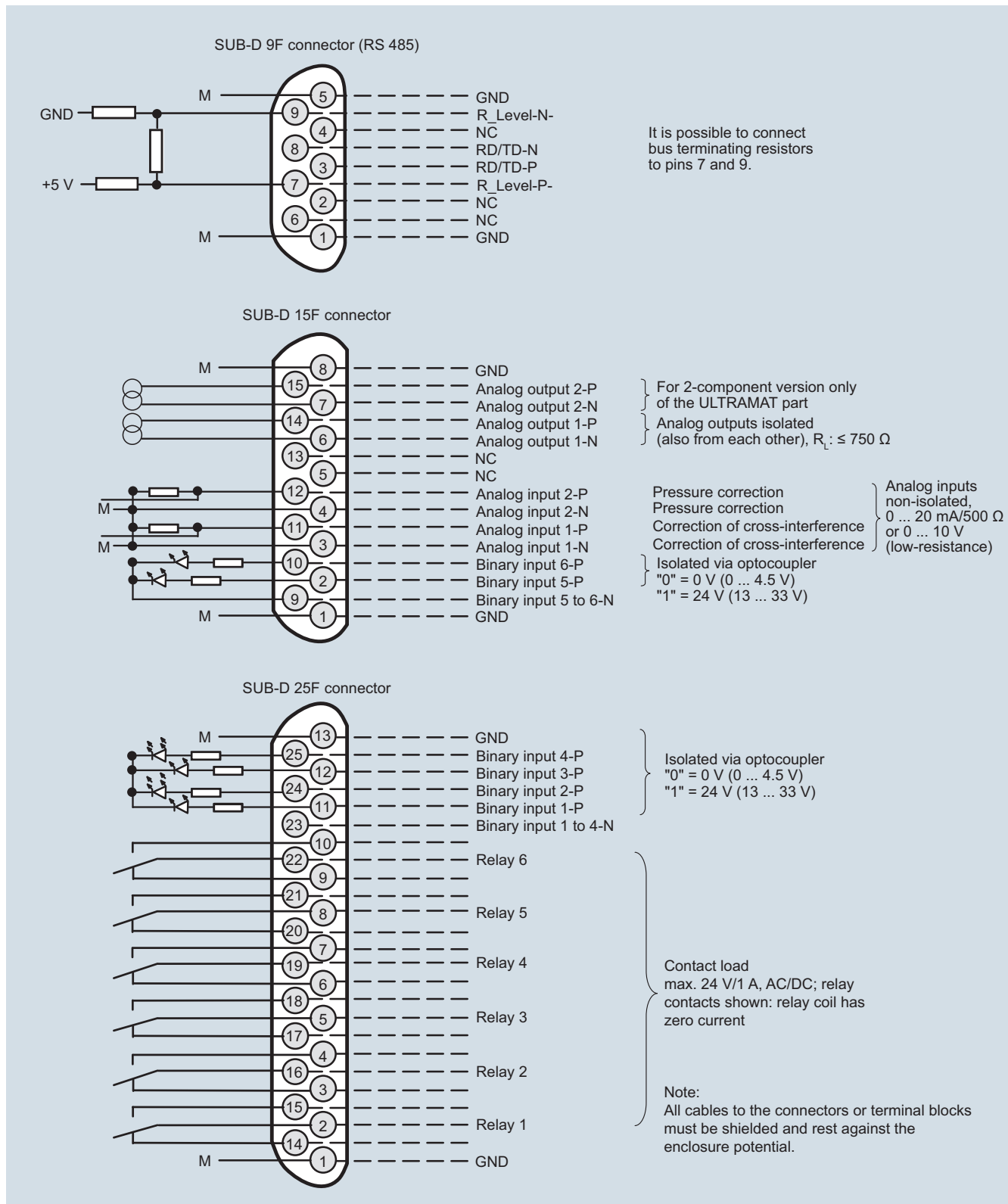
Dimensional drawings



ULTRAMAT 6, 19" unit, dimensions in mm (example: 1-channel version)

Schematics

Pin assignment (electrical and gas connections)



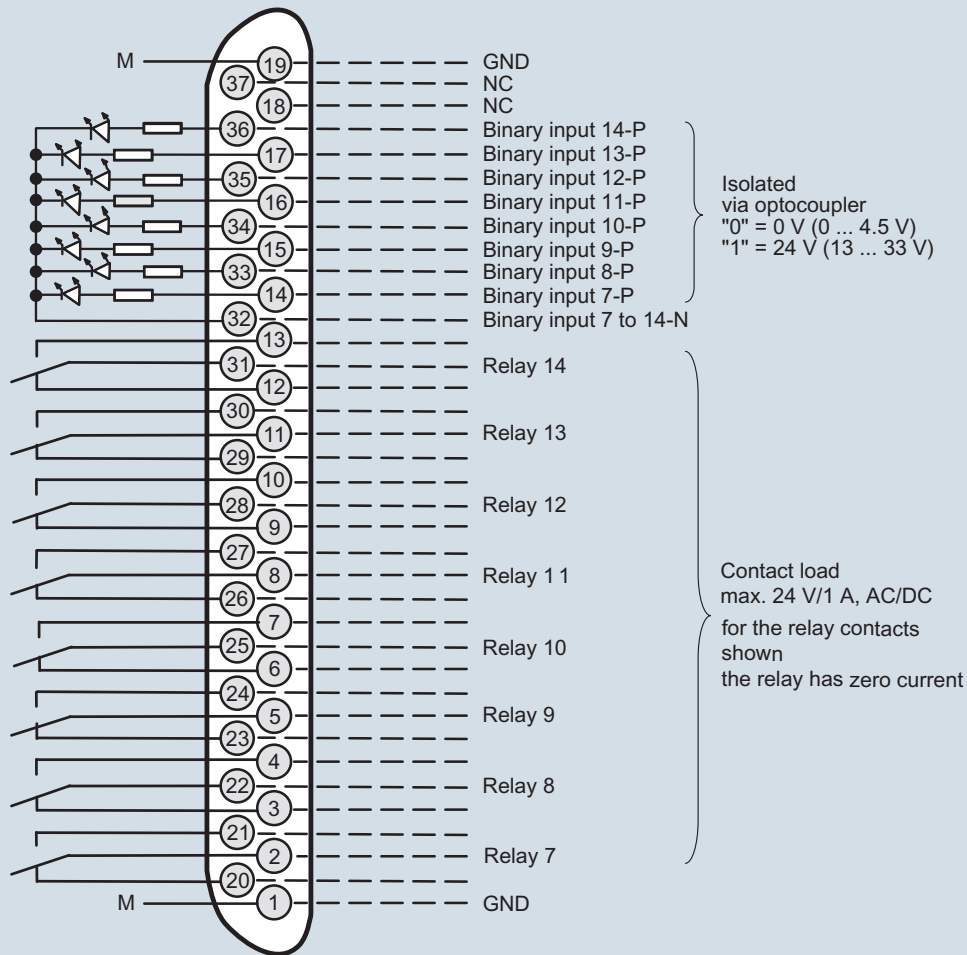
ULTRAMAT 6, 19" unit, pin assignment

Continuous Gas Analyzers, extractive ULTRAMAT 6

19" rack unit

1

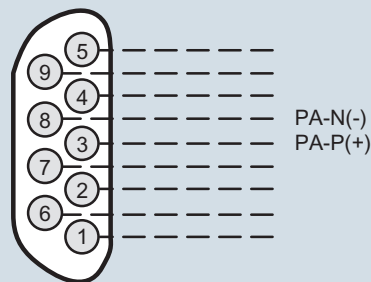
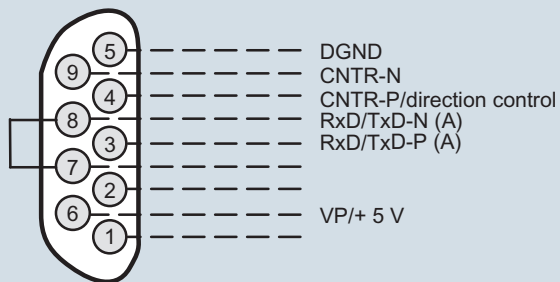
Connector SUB-D 37F (option)



Connector SUB-D 9F
PROFIBUS DP

optional

Connector SUB-D 9M
PROFIBUS PA



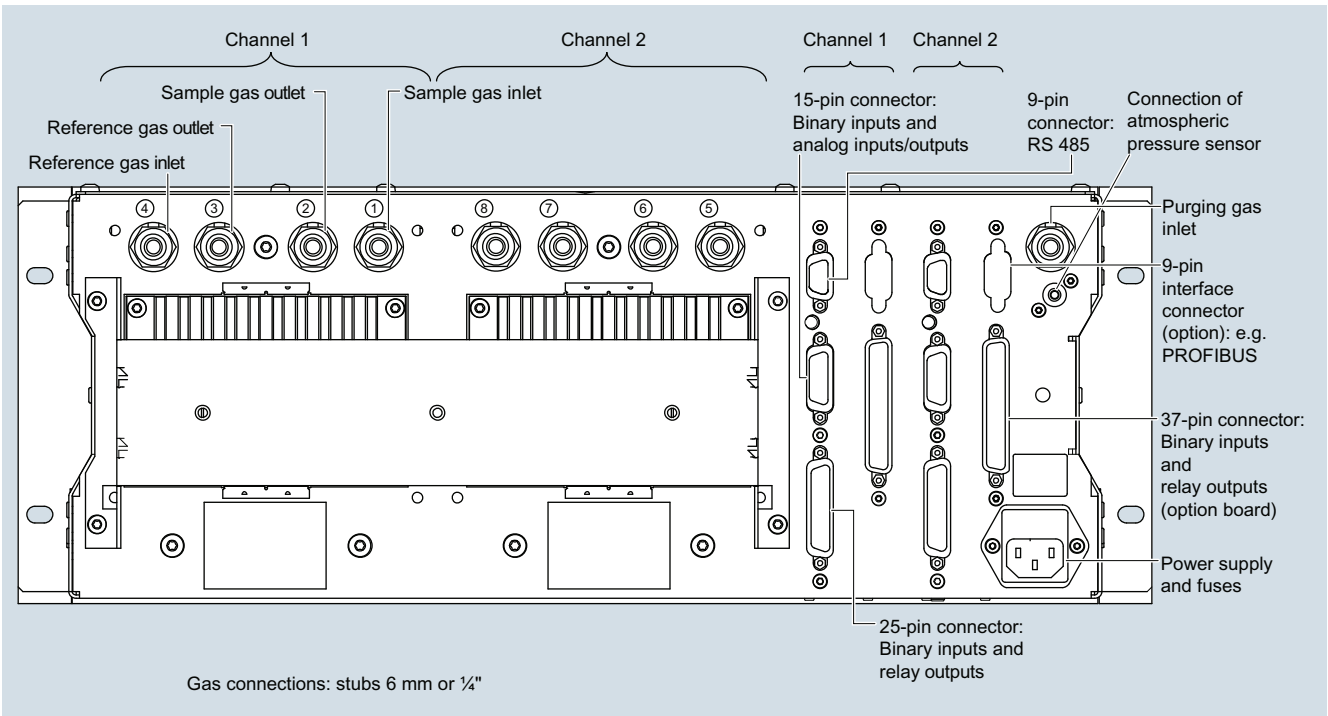
Note:
All cables to the connectors or terminal blocks must be shielded and rest against the enclosure potential.

ULTRAMAT 6, 19" unit, pin assignment of AUTOCAL board and PROFIBUS connectors

Continuous Gas Analyzers, extractive ULTRAMAT 6

19" rack unit

1



ULTRAMAT 6, 19" unit, gas and electrical connections (example: 2-channel version)

Continuous Gas Analyzers, extractive

ULTRAMAT 6

Field device

Technical specifications

General information

Measuring ranges	4, internally and externally switchable; autoranging is also possible
Smallest possible measuring range	Dependent on the application, e.g. CO: 0 ... 10 vpm, CO ₂ : 0 ... 5 vpm
Largest possible measuring range	Dependent on the application
Measuring range with suppressed zero point	Any zero point within 0 ... 100 vol.% can be implemented; smallest possible span 20 %
Heated version	65 °C
Operating position	Front wall, vertical
Conformity	CE mark in accordance with EN 50081-1, EN 50082-2

Influence of interfering gases must be considered separately

Design, enclosure

Weight	Approx. 32 kg
Degree of protection	IP65 in accordance with EN 60529, restricted breathing enclosure to EN 50021

Electrical characteristics

Power supply	100 ... 120 V AC (nominal range of use 90 ... 132 V), 48 ... 63 Hz or 200 ... 240 V AC (nominal range of use 180 ... 264 V), 48 ... 63 Hz
Power consumption	Approx. 35 VA; approx. 330 VA with heated version
EMC (Electromagnetic Compatibility)	In accordance with standard requirements of NAMUR NE21 (08/98)
Electrical safety	In accordance with EN 61010-1
• Heated units	Overvoltage category II
• Unheated units	Overvoltage category III
Fuse values (unheated unit)	
• 100 ... 120 V	F3: 1 T/250; F4: 1 T/250
• 200 ... 240 V	F3: 0.63 T/250; F4: 0.63 T/250
Fuse values (heated unit)	
• 100 ... 120 V	F1: 1 T/250; F2: 4 T/250 F3: 4 T/250; F4: 4 T/250
• 200 ... 240 V	F1: 0.63 T/250; F2: 2.5 T/250 F3: 2.5 T/250; F4: 2.5 T/250

Gas inlet conditions

Permissible sample gas pressure	
• With hoses (without pressure switch)	600 ... 1 500 hPa (absolute)
• With pipes (without pressure switch)	600 ... 1 500 hPa (absolute)
- Ex (leakage compensation)	600 ... 1 160 hPa (absolute)
- Ex (continuous purging)	600 ... 1 500 hPa (absolute)
Purging gas pressure	
• Permanent	< 165 hPa above ambient pressure
• For short periods	250 hPa above ambient pressure
Sample gas flow	18 ... 90 l/h (0.3 ... 1.5 l/min)
Sample gas temperature	Min. 0 ... max. 50 °C, but above the dew point, for heated version min. 0 ... max. 80 °C
Sample gas humidity	< 90 % RH (RH: relative humidity) or dependent on measuring task

Dynamic response

Warm-up period	At room temperature < 30 min (the technical specification will be met after 2 hours)
Delayed display (T ₉₀ -time)	Dependent on length of analyzer chamber, sample gas line and parameterizable damping
Damping (electrical time constant)	0 ... 100 s, parameterizable
Dead time (purging time of the gas path in the unit at 1 l/min)	Approximately 0.5 ... 5 s, depending on version
Time for device-internal signal processing	< 1 s

Pressure correction range

Pressure sensor	
• Internal	700 ... 1 200 hPa absolute
• External	700 ... 1 500 hPa absolute

Measuring response (relating to sample gas pressure 1 013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Output signal fluctuation	< ± 1 % of the smallest possible measuring range according to rating plate
Zero point drift	< ± 1 % of the current measuring range/week
Measured-value drift	< ± 1 % of the current measuring range/week
Repeatability	≤ 1 % of the current measuring range
Detection limit	1 % of the smallest possible measuring range
Linearity error	< 0.5 % of the full-scale value

Influencing variables (relating to sample gas pressure 1 013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Ambient temperature	< 1 % of current measuring range/10 K (with constant receiver cell temperature)
Sample gas pressure	When pressure compensation has been switched on: < 0.15 % of setpoint/1 % atmospheric pressure change
Sample gas flow	Negligible
Power supply	< 0.1 % of the current measuring range with rated voltage \pm 10 %
Environmental conditions	Application-specific measuring influences possible if ambient air contains measured component or cross interference-sensitive gases

Electrical inputs and outputs

Analog output	0/2/4 ... 20 mA, isolated; load 750 Ω
Relay outputs	6, with changeover contacts, freely parameterizable, e.g. for measuring range identification; load: 24 V AC/DC/1 A, isolated, non-sparking
Analog inputs	2, dimensioned for 0/2/4 ... 20 mA for external pressure sensor and accompanying gas influence correction (correction of cross-interference)
Binary inputs	6, designed for 24 V, isolated, freely parameterizable, e.g. for measuring range switchover
Serial interface	RS 485
Options	AUTOCAL function with 8 additional binary inputs and relay outputs, also with PROFIBUS PA or PROFIBUS DP

Climatic conditions

Permissible ambient temperature	-30 ... +70 °C during storage and transportation; 5 ... 45 °C during operation
Permissible humidity	< 90 % RH (RH: relative humidity) within average annual value, during storage and transportation (dew point must not be undershot)

Continuous Gas Analyzers, extractive ULTRAMAT 6

Field device

1

Selection and ordering data

ULTRAMAT 6 gas analyzer

For installation in the field, single-channel, 1 component

Article No.

7MB2111- - - - - A

Cannot be combined

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Gas connections

Ferrule screw connection for pipe, outer diameter 6 mm

Ferrule screw connection for pipe, outer diameter 1/4"

0
1

0 → A29
1 → A28

Measured component

Possible with measuring range identification

CO	11 ... 30	A
CO highly selective (with optical filter)	12 ... 30	B
CO (TÜV; see table "TÜV single component", page 1/69)		X
CO ₂	10 ... 30	C
CH ₄	13 ... 30	D
C ₂ H ₂	15 ... 30	E
C ₂ H ₄	15 ... 30	F
C ₂ H ₆	14 ... 30	G
C ₃ H ₆	14 ... 30	H
C ₃ H ₈	13 ... 30	J
C ₄ H ₆	15 ... 30	K
C ₄ H ₁₀	14 ... 30	L
C ₆ H ₁₄	14 ... 30	M
SO ₂ (TÜV; see table "TÜV single component", page 1/69)	13 ... 30	N
NO (TÜV; see table "TÜV single component", page 1/69)	14 ... 20, 22	P
NH ₃ (dry)	14 ... 30	Q
H ₂ O	17 ... 20; 22 (17 to 24, 26; heated)	R
N ₂ O	13 ... 30	S

Q
R

Smallest measuring range	Largest measuring range	Measuring range identification
0 ... 5 vpm	0 ... 100 vpm	10
0 ... 10 vpm	0 ... 200 vpm	11
0 ... 20 vpm	0 ... 400 vpm	12
0 ... 50 vpm	0 ... 1 000 vpm	13
0 ... 100 vpm	0 ... 1 000 vpm	14
0 ... 300 vpm	0 ... 3 000 vpm	15
0 ... 500 vpm	0 ... 5 000 vpm	16
0 ... 1 000 vpm	0 ... 10 000 vpm	17
0 ... 3 000 vpm	0 ... 10 000 vpm	19
0 ... 3 000 vpm	0 ... 30 000 vpm	19
0 ... 5 000 vpm	0 ... 15 000 vpm	20
0 ... 5 000 vpm	0 ... 50 000 vpm	21
0 ... 1 %	0 ... 3 %	22
0 ... 1 %	0 ... 10 %	23
0 ... 3 %	0 ... 10 %	24
0 ... 3 %	0 ... 30 %	25
0 ... 5 %	0 ... 15 %	26
0 ... 5 %	0 ... 50 %	27
0 ... 10 %	0 ... 30 %	28
0 ... 10 %	0 ... 100 %	29
0 ... 30 %	0 ... 100 %	30

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
S
T
U
V
W

Continuous Gas Analyzers, extractive

ULTRAMAT 6

Field device

Selection and ordering data

<i>Additional versions</i>	Order code
Add "-Z" to Article No. and specify Order codes.	
Flow-type reference cell with reduced flow, 6 mm	A28
Flow-type reference cell with reduced flow, 1/4"	A29
TAG labels (specific lettering based on customer information)	B03
Kalrez gaskets in sample gas path	B04
SIL conformity declaration (SIL 2) Functional Safety according to IEC 61508 and IEC 61511	C20
<u>Ex versions</u>	
Possible combinations: see: Table "Ex configurations – principle selection criteria", page 5/16	
ATEX II 3G certificate; restricted breathing enclosure, non-flammable gases	E11
ATEX II 3G certificate; flammable gases	E12
FM/CSA certificate – Class I Div 2	E20
ATEX II 3D certificate; potentially explosive dust atmospheres	
• In non-hazardous gas zone	E40
• In Ex zone acc. to ATEX II 3G, non-flammable gases	E41
• In Ex zone acc. to ATEX II 3G, flammable gases ¹⁾	E42
BARTEC Ex p control unit "Leakage compensation"	E71
BARTEC Ex p control unit "Continuous purging"	E72
Clean for O ₂ service (specially cleaned gas path)	Y02
Measuring range indication in plain text, if different from the standard setting	Y11
Special setting (only in conjunction with an application no., e.g. extended measuring range)	Y12
Extended special setting (only in conjunction with an application no., e.g. determination of cross-interferences)	Y13
TÜV version acc. to 13th and 17th BImSchV	Y17
<u>Additional units for Ex versions</u>	Article No.
<u>Category ATEX II 2G (zone 1)</u>	
BARTEC Ex p control unit, 230 V, "leakage compensation"	7MB8000-2BA
BARTEC Ex p control unit, 115 V, "leakage compensation"	7MB8000-2BB
BARTEC Ex p control unit, 230 V, "continuous purging"	7MB8000-2CA
BARTEC Ex p control unit, 115 V, "continuous purging"	7MB8000-2CB
Ex i isolating transformer	7MB8000-3AB
Ex isolating relay, 230 V	7MB8000-4AA
Ex isolating relay, 110 V	7MB8000-4AB
Differential pressure switch for corrosive and non-corrosive gases	7MB8000-5AA
Stainless steel flame arrestor	7MB8000-6BA
Hastelloy flame arrestor	7MB8000-6BB
<u>Category ATEX II 3G (Zone 2)</u>	
BARTEC Ex p control unit, 230 V, "continuous purging"	7MB8000-2CA
BARTEC Ex p control unit, 115 V, "continuous purging"	7MB8000-2CB
<u>FM/CSA (Class I Div. 2)</u>	
Ex purging unit MiniPurge FM	7MB8000-1AA
<u>Accessories</u>	Article No.
RS 485/Ethernet converter	A5E00852383
RS 485/RS 232 converter	C79451-Z1589-U1
RS 485/USB converter	A5E00852382
AUTOCAL function with 8 digital inputs/outputs	A5E00064223
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA	A5E00057315
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS DP	A5E00057318
AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA Ex i (firmware 4.1.10 required)	A5E00057317
Set of Torx screwdrivers	A5E34821625

¹⁾ Only in connection with an approved purging unit

Selection and ordering data

Article No.

ULTRAMAT 6 gas analyzer

7MB2112- - - - - A

Cannot be combined

For installation in the field, single-channel, 2 components

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Gas connections

Ferrule screw connection for pipe, outer diameter 6 mm

Ferrule screw connection for pipe, outer diameter 1/4"

Measured component	Smallest measuring range	Largest measuring range	
CO	0 ... 100 vpm	0 ... 1 000 vpm	A A
NO	0 ... 100 vpm	0 ... 1 000 vpm	
CO	0 ... 300 vpm	0 ... 3 000 vpm	A B
NO	0 ... 300 vpm	0 ... 3 000 vpm	
CO	0 ... 1 000 vpm	0 ... 10 000 vpm	A C
NO	0 ... 1 000 vpm	0 ... 10 000 vpm	
For CO/NO (TÜV; see table "TÜV, 2 components in series", page 1/69)			
CO ₂	0 ... 100 vpm	0 ... 1 000 vpm	B A
CO	0 ... 100 vpm	0 ... 1 000 vpm	
CO ₂	0 ... 300 vpm	0 ... 3 000 vpm	B B
CO	0 ... 300 vpm	0 ... 3 000 vpm	
CO ₂	0 ... 1 000 vpm	0 ... 10 000 vpm	B C
CO	0 ... 1 000 vpm	0 ... 10 000 vpm	
CO ₂	0 ... 3 000 vpm	0 ... 30 000 vpm	B D
CO	0 ... 3 000 vpm	0 ... 30 000 vpm	
CO ₂	0 ... 1 %	0 ... 10 %	B E
CO	0 ... 1 %	0 ... 10 %	
CO ₂	0 ... 3 %	0 ... 30 %	B F
CO	0 ... 3 %	0 ... 30 %	
CO ₂	0 ... 10 %	0 ... 100 %	B G
CO	0 ... 10 %	0 ... 100 %	
CO ₂	0 ... 10 %	0 ... 100 %	C G
CH ₄	0 ... 10 %	0 ... 100 %	
CO ₂	0 ... 100 vpm	0 ... 1 000 vpm	D A
NO	0 ... 100 vpm	0 ... 1 000 vpm	
CO ₂	0 ... 300 vpm	0 ... 3 000 vpm	D B
NO	0 ... 300 vpm	0 ... 3 000 vpm	

Internal gas paths	Sample chamber (lining)	Reference chamber (flow-type)	
Hose made of FKM (Viton)	Aluminum	Non-flow-type	0
	Aluminum	Flow-type	1
Pipe made of titanium	Tantalum ¹⁾	Non-flow-type	2
	Tantalum ¹⁾	Flow-type	3
	Aluminum	Non-flow-type	6
Stainless steel pipe (mat. no. 1.4571)	Tantalum ¹⁾	Non-flow-type	8

Add-on electronics

Without

AUTOCAL function

- With 8 additional digital inputs/outputs
- With 8 digital inputs/outputs and PROFIBUS PA interface
- With 8 digital inputs/outputs and PROFIBUS DP interface
- With 8 digital inputs/outputs and PROFIBUS PA Ex i

Power supply

Standard unit and acc. to ATEX II 3G version (Zone 2)

- 100 ... 120 V AC, 48 ... 63 Hz
- 200 ... 240 V AC, 48 ... 63 Hz

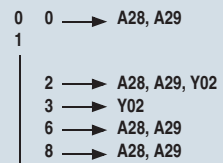
ATEX II 2G versions (Zone 1), incl. certificate

- 100 ... 120 V AC, 48 ... 63 Hz, according to ATEX II 2G²⁾ (operating mode: leakage compensation)
- 200 ... 240 V AC, 48 ... 63 Hz, according to ATEX II 2G²⁾ (operating mode: leakage compensation)
- 100 ... 120 V AC, 48 ... 63 Hz, according to ATEX II 2G²⁾ (operating mode: continuous purging)
- 200 ... 240 V AC, 48 ... 63 Hz, according to ATEX II 2G²⁾ (operating mode: continuous purging)

Heating of internal gas paths and analyzer unit

none

With (max. 65 °C)



Continuous Gas Analyzers, extractive

ULTRAMAT 6

Field device

Selection and ordering data

ULTRAMAT 6 gas analyzer
For installation in the field, single-channel, 2 components

Article No.

7MB2112- - A Cannot be combined

Language (supplied documentation, software)

German
English
French
Spanish
Italian

0
1
2
3
4

¹⁾ Only for cell length 20 to 180 mm.

²⁾ See also "Additional units for Ex versions".

Additional versions

Order code

Add "-Z" to Article No. and specify Order codes.

Flow-type reference cell with reduced flow, 6 mm

A28

Flow-type reference cell with reduced flow, ¼"

A29

TAG labels (specific lettering based on customer information)

B03

Kalrez gaskets in sample gas path

B04

SIL conformity declaration (SIL 2) Functional Safety according to IEC 61508 and IEC 61511

C20

Ex versions

Possible combinations: see: Table "Ex configurations – principle selection criteria", page 5/16

ATEX II 3G certificate; restricted breathing enclosure, non-flammable gases

E11

ATEX II 3G certificate; flammable gases

E12

CSA certificate – Class I Div 2

E20

ATEX II 3D certificate; potentially explosive dust atmospheres

- In non-hazardous gas zone

E40

- In Ex zone acc. to ATEX II 3G, non-flammable gases

E41

- In Ex zone acc. to ATEX II 3G, flammable gases

E42

BARTEC Ex p control unit "Leakage compensation"

E71

BARTEC Ex p control unit "Continuous purging"

E72

Clean for O₂ service (specially cleaned gas path)

Y02

Measuring range indication in plain text, if different from the standard setting

Y11

Special setting (only in conjunction with an application no., e.g. extended measuring range)

Y12

Extended special setting

Y13

(only in conjunction with an application no., e.g. determination of cross-interferences)

TÜV version acc. to 13th and 17th BImSchV

Y17

Additional units for Ex versions

Article No.

Category ATEX II 2G (zone 1)

BARTEC Ex p control unit, 230 V, "leakage compensation"

7MB8000-2BA

BARTEC Ex p control unit, 115 V, "leakage compensation"

7MB8000-2BB

BARTEC Ex p control unit, 230 V, "continuous purging"

7MB8000-2CA

BARTEC Ex p control unit, 115 V, "continuous purging"

7MB8000-2CB

Ex i isolating transformer

7MB8000-3AB

Ex isolating relay, 230 V

7MB8000-4AA

Ex isolating relay, 110 V

7MB8000-4AB

Differential pressure switch for corrosive and non-corrosive gases

7MB8000-5AA

Stainless steel flame arrestor

7MB8000-6BA

Hastelloy flame arrestor

7MB8000-6BB

Category ATEX II 3G (Zone 2)

BARTEC Ex p control unit, 230 V, "continuous purging"

7MB8000-2CA

BARTEC Ex p control unit, 115 V, "continuous purging"

7MB8000-2CB

FM/CSA (Class I Div. 2)

Ex purging unit MiniPurge FM

7MB8000-1AA

Accessories

Article No.

RS 485/Ethernet converter

A5E00852383

RS 485/RS 232 converter

C79451-Z1589-U1

RS 485/USB converter

A5E00852382

AUTOCAL function with 8 digital inputs/outputs

A5E00064223

AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA

A5E00057315

AUTOCAL function with 8 digital inputs/outputs and PROFIBUS DP

A5E00057318

AUTOCAL function with 8 digital inputs/outputs and PROFIBUS PA Ex i (firmware 4.1.10 required)

A5E00057317

Set of Torx screwdrivers

A5E34821625

TÜV, single component

(only with additional suffix Z (Y17, Y18))

Component	CO (TÜV)		SO ₂ (TÜV)		NO (TÜV)	
	Measuring range identification	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...	Largest measuring range from 0 to ...
C			75 mg/m ³	1 500 mg/m ³		
D		50 mg/m ³	300 mg/m ³	3 000 mg/m ³		
E			500 mg/m ³	5 000 mg/m ³	100 mg/m ³	2 000 mg/m ³
F		300 mg/m ³	1 000 mg/m ³	10 000 mg/m ³	300 mg/m ³	3 000 mg/m ³
G		500 mg/m ³			500 mg/m ³	5 000 mg/m ³
H		1 000 mg/m ³	3 000 mg/m ³	30 000 mg/m ³	1 000 mg/m ³	10 000 mg/m ³
K		3 000 mg/m ³	10 g/m ³	100 g/m ³	3 000 mg/m ³	30 000 mg/m ³
P		10 g/m ³	30 g/m ³	300 g/m ³	10 g/m ³	100 g/m ³
R		30 g/m ³	100 g/m ³	1 000 g/m ³	30 g/m ³	300 g/m ³
V		100 g/m ³	300 g/m ³	2 630 g/m ³	100 g/m ³	1 250 g/m ³

Example for ordering

ULTRAMAT 6, TÜV (1-component unit)

Component: CO

Measuring range: 0 to 50 / 1 000 mg/m³

with hoses, non-flow-type reference compartment

without automatic adjustment (AUTOCAL)

230 V AC; without heating, German

7MB2111-0XD00-1AA0-Z +Y17**TÜV, 2 components in series**

Component	CO (TÜV)		NO (TÜV)	
	Measuring range identification	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...	Largest measuring range from 0 to ...
AA		75 mg/m ³	1 000 mg/m ³	2 000 mg/m ³
AB		300 mg/m ³	3 000 mg/m ³	3 000 mg/m ³
AC		1 000 mg/m ³	10 000 mg/m ³	10 000 mg/m ³

Example for ordering

ULTRAMAT 6, TÜV (2 components in series)

Components: CO/NO

Measuring range CO: 0 to 75 / 1 000 mg/m³, NO: 0 to 200 / 2 000 mg/m³

with hoses, non-flow-type reference compartment

without automatic adjustment (AUTOCAL)

230 V AC; without heating, German

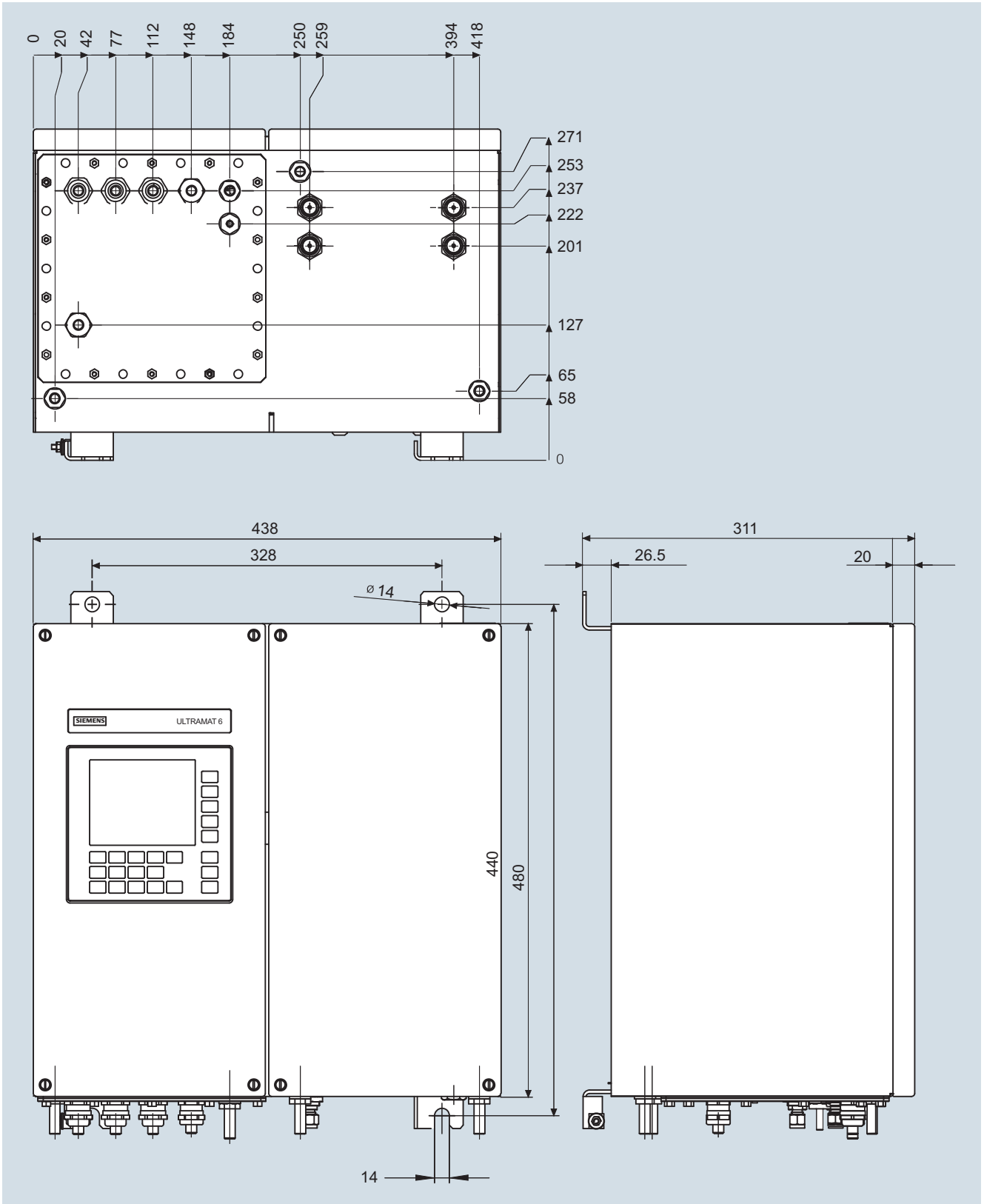
7MB2112-0AA00-1AA0-Z +Y17**Note:** for 3 components take both tables into consideration.Ordering information measured component N₂OCertification in accordance with AM0028 and AM0034 (Kyoto Protocol) for measuring N₂O,
measuring range 0 to 300 vpm / 3 000 vpm.

Version: Standard device

Continuous Gas Analyzers, extractive ULTRAMAT 6

Field device

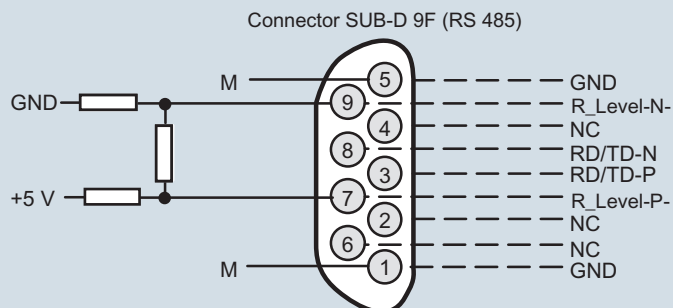
Dimensional drawings



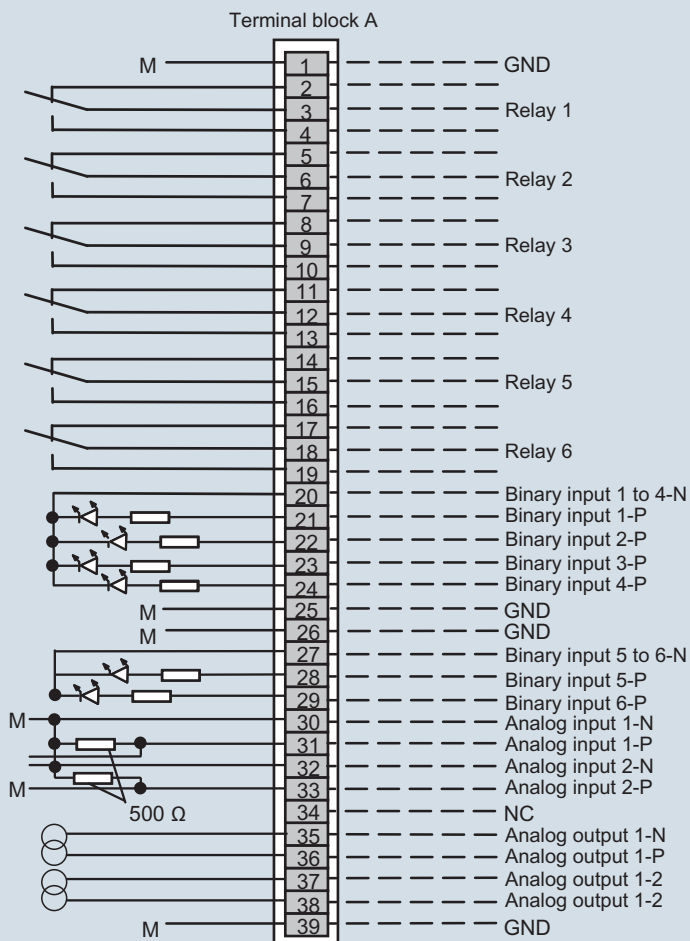
ULTRAMAT 6, field unit, dimensions in mm

Schematics

Pin assignment (electrical and gas connections)



It is possible to connect bus terminating resistors to pins 7 and 9.



Contact load max.
24 V/1 A, AC/DC; relay contacts shown: relay coil has zero current

Isolated via optocoupler
"0" = 0 V (0 ... 4.5 V)
"1" = 24 V (13 ... 33 V)

Isolated via optocoupler
"0" = 0 V (0 ... 4.5 V)
"1" = 24 V (13 ... 33 V)
} Correction of cross-interference } Analog inputs non-isolated,
} Pressure correction } 0 ... 20 mA or 0 ... 10 V (internal resistance ≤ 500 Ω)

} Component 1 }
} Component 2 (if available) } Analog outputs isolated

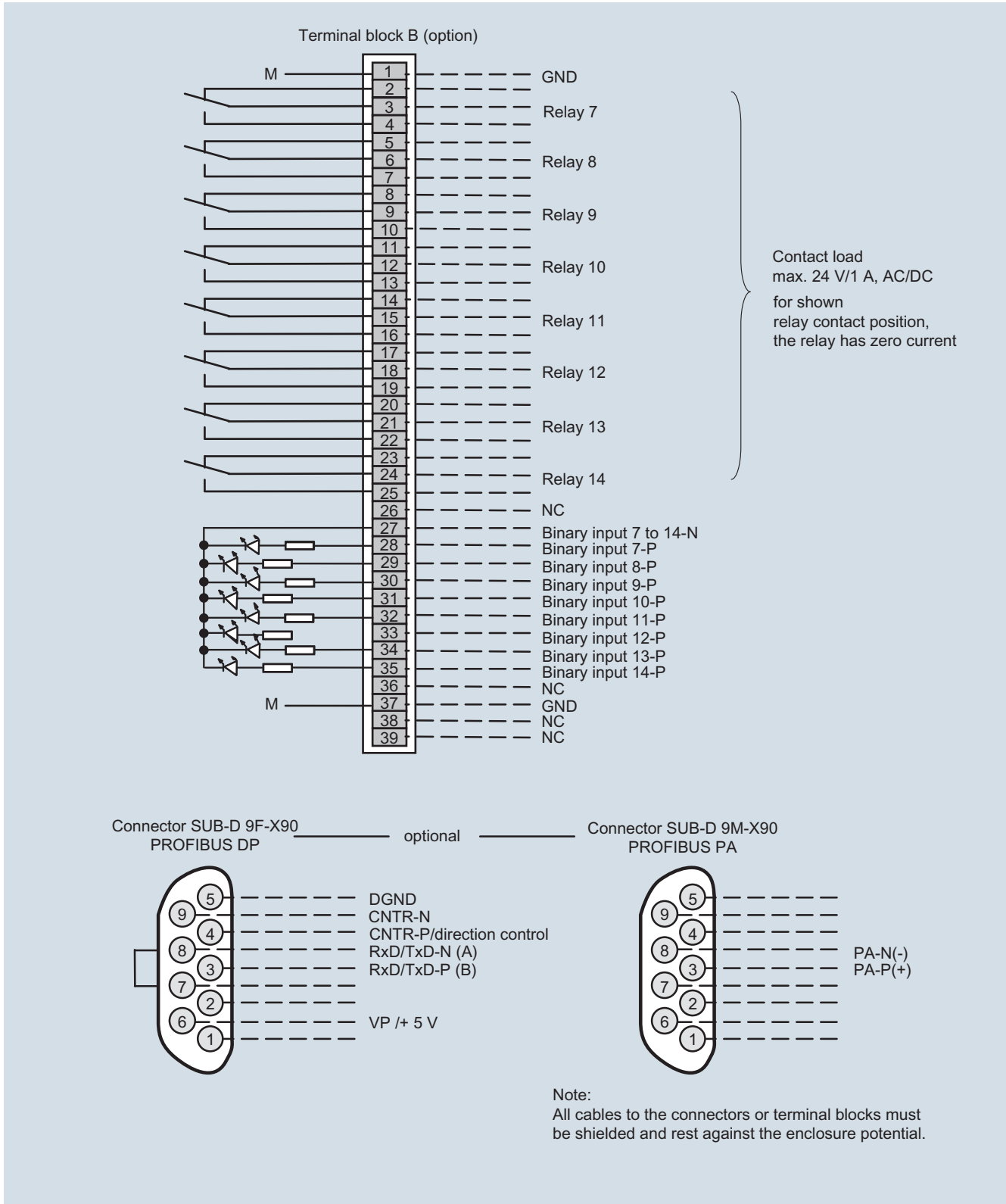
Note:
All cables to the connectors or terminal blocks must be shielded and rest against the enclosure potential.

ULTRAMAT 6, field device, pin and terminal assignment

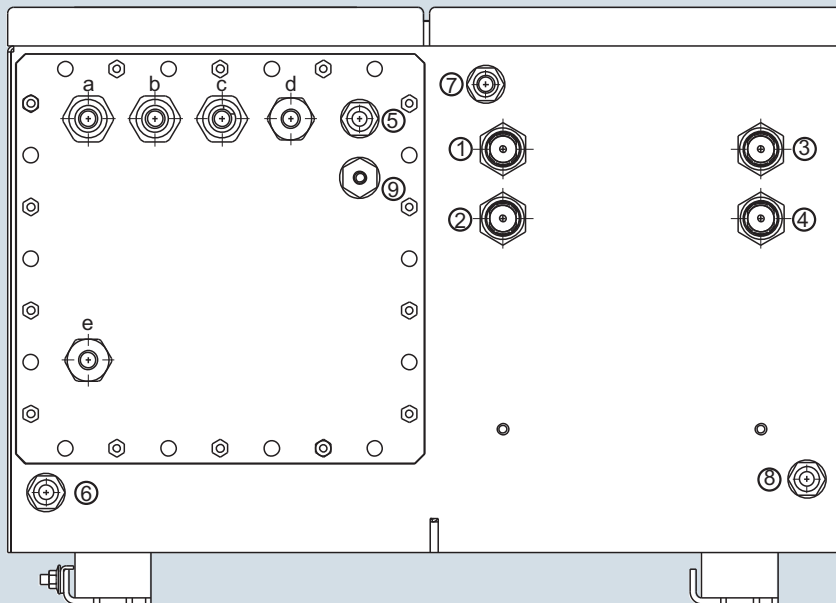
Continuous Gas Analyzers, extractive ULTRAMAT 6

Field device

1



ULTRAMAT 6, field device, pin and terminal assignment of the AUTOCAL board and PROFIBUS connectors



Gas connections

- | | | |
|-----|--|---|
| ① | Sample gas inlet | } Clamping gland for pipe
Ø 6 mm or ¼" |
| ② | Sample gas outlet | |
| ③ | Reference gas inlet (option) | |
| ④ | Reference gas outlet (option) | |
| ⑤-⑧ | Purging gas inlets/outlets, stubs Ø 10 mm or 3/8" | |
| ⑨ | Connection atmospheric pressure sensor, stubs Ø ¼" | |

Electrical connections

- | | |
|-------|--|
| a - c | Signal cable (Ø 10 ... 14 mm)
(analog + digital): cable gland M20x1.5 |
| d | Interface connection: (Ø 7 ... 12 mm)
cable gland M20x1.5 |
| e | Power supply: (Ø 7 ... 12 mm)
cable gland M20x1.5 |

ULTRAMAT 6, field device, gas connections and electrical connections

Selection and ordering data

Operating instructions	Article No.
ULTRAMAT 6 / OXYMAT 6	
Gas analyzer for IR-absorbing gases and oxygen	
• German	C79000-G5200-C143
• English	C79000-G5276-C143
• French	C79000-G5277-C143
• Spanish	C79000-G5278-C143
• Italian	C79000-G5272-C143

Continuous Gas Analyzers, extractive

ULTRAMAT 6

Suggestions for spare parts

Selection and ordering data

Description							2 years (quantity)	5 years (quantity)	Article No.
	7MB-2121	7MB-2123	7MB-2124	7MB-2111	7MB-2112	7MB-2111/2 Ex			
Analyzer unit									
O-ring for cover (window)	x	x	x	x	x	x	2	4	C79121-Z100-A24
Cover (cell length 20 ... 180 mm)	x	x	x	x	x	x	2	2	C79451-A3462-B151
Cover (cell length 0.2 ... 6 mm)	x	x	x	x	x	x	2	2	C79451-A3462-B152
O-rings, set	x	x	x	x	x	x		1	C79451-A3462-D501
Sample gas path									
O-ring (hose clip)				x	x	x	2	4	C71121-Z100-A159
Pressure switch	x	x	x				1	2	C79302-Z1210-A2
Flow indicator	x	x	x				1	2	C79402-Z560-T1
Hose clip	x	x	x	x	x	x		1	C79451-A3478-C9
Heating cartridge (heated unit)				x	x	x		1	W75083-A1004-F120
Electronics									
Temperature fuse (heated unit)				x	x			1	W75054-T1001-A150
Fuse (device fuse)						x	1	2	A5E00061505
Temperature controller - electronics, 230 V AC				x	x	x		1	A5E00118527
Temperature controller - electronics, 115 V AC				x	x	x		1	A5E00118530
Fan, 24 V DC (heated unit)				x	x	x		1	A5E00302916
Front plate with keyboard	x	x	x				1	1	C79165-A3042-B504
Temperature sensor				x	x	x		1	C79165-A3044-B176
Adapter plate, LCD/keyboard	x	x	x	x	x		1	1	C79451-A3474-B605
Motherboard, with firmware: see spare parts list	x	x	x	x	x	x		1	
LC display	x	x	x	x	x		1	1	W75025-B5001-B1
Connector filter	x	x	x	x	x			1	W75041-E5602-K2
Fusible element, T 0.63 A/250 V	x		x	x	x	x	2	3	W79054-L1010-T630
Fusible element, T 1 A/250 V	x	x	x	x	x	x	2	3	W79054-L1011-T100
Fusible element, T 1.6 A/250 V		x	x				2	3	W79054-L1011-T160
Fusible element, T 2.5 A/250 V				x	x	x	2	3	W79054-L1011-T250

If the ULTRAMAT 6 is supplied with a specially cleaned gas path for high oxygen content ("Cleaned for O₂ service"), please ensure that you specify this when ordering spare parts. This is the only way to guarantee that the gas path will continue to comply with the special requirements for this version.