

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 , CO_2 , NO , SO_2 , NH_3 , H_2O as well as CH_4 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 (in accordance with ATEX 2G and ATEX 3G)

Application

- Measurement for boiler control in combustion plants
- Emission measurements in combustion 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 chambers (e.g. Titan, Hastelloy C22) and measured components are also available on request

Application (Continued)

Performance-tested version / QAL

For measurements of CO , NO , SO_2 and O_2 according to sections 13 and 27 of the German Federal Immission Protection Regulations and TA Luft, performance-tested versions according to EN 15267 are available.

Certified measuring range:

- 1-component analyzer
 - CO: 0 to 75 mg/m^3 ; 0 to 10 000 mg/m^3
 - NO: 0 to 100 mg/m^3 ; 0 to 10 000 mg/m^3
 - SO₂: 0 to 75 mg/m^3 ; 0 to 1 500 mg/m^3
- O₂: 0 to 5 vol.%; 0 to 25 vol.%

In addition, performance-tested versions of the ULTRAMAT 6 meet the requirements set forth in EN 14956 and QAL1 according to EN 14181. Conformity of the analyzers with both standards is TÜV-certified.

Determination of the analyzer drift according to EN 14181 (QAL3) can be carried out manually or also 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 cell

- The flow through the reference cell should be adapted to the sample gas flow
- The gas supply of the reduced flow-type reference cell should have a primary pressure of 3 000 to 5 000 hPa (abs.). The flow is then automatically regulated at approximately 8 ml/min using a restrictor

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6

Design

19" rack unit

- 19" rack unit with 4 U for installation
 - In hinged frame
 - In cabinets with or without telescopic rails
- Front plate can be swung down for servicing purposes (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 the electronics modules from parts conveying gas
- 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"

Display and operator panel

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

Inputs 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-interference or external pressure sensor)
- Six digital inputs freely configurable (e.g. for measuring range switchover, processing of external signals from sample preparation)
- Six relay outputs freely configurable e.g. for fault, maintenance demanded, limit alarm, external solenoid valves
- Expandable with eight additional digital inputs and eight additional relay outputs e.g. for autocalibration with up to four calibration gases

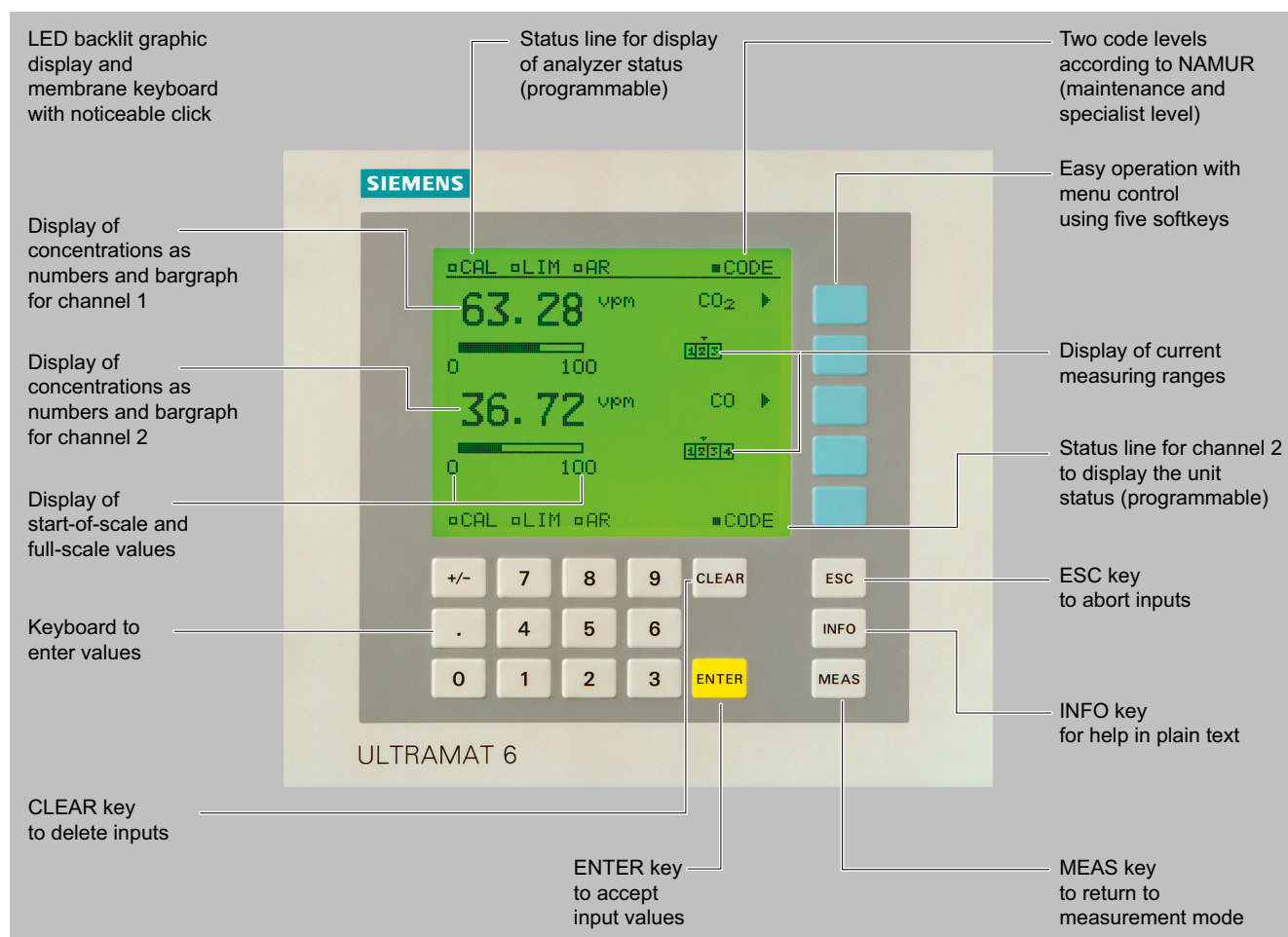
Communication

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

Design (Continued)



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	Stainless steel, mat. no. 1.4571	-
	Hose	FKM (e.g. Viton)	FKM (e.g. Viton)	-
	Sample chamber:			
	• Body	Aluminum	Aluminum	-
	• Lining	Aluminum	Aluminum	-
• Fitting		Stainless steel, mat. no. 1.4571	Stainless steel, mat. no. 1.4571	-
		O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	-
	• Window	CaF ₂ , adhesive: E353, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	CaF ₂ , adhesive: E353, O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	-
With pipes	Bushing	Titanium	Titanium	Titanium
	Pipe	Titanium	Titanium	Titanium
		O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	O-ring: FKM (e.g. Viton) or FFKM (Kalrez)
Sample chamber:				
• Body	Aluminum	Aluminum	Aluminum	

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Design (Continued)

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

Options

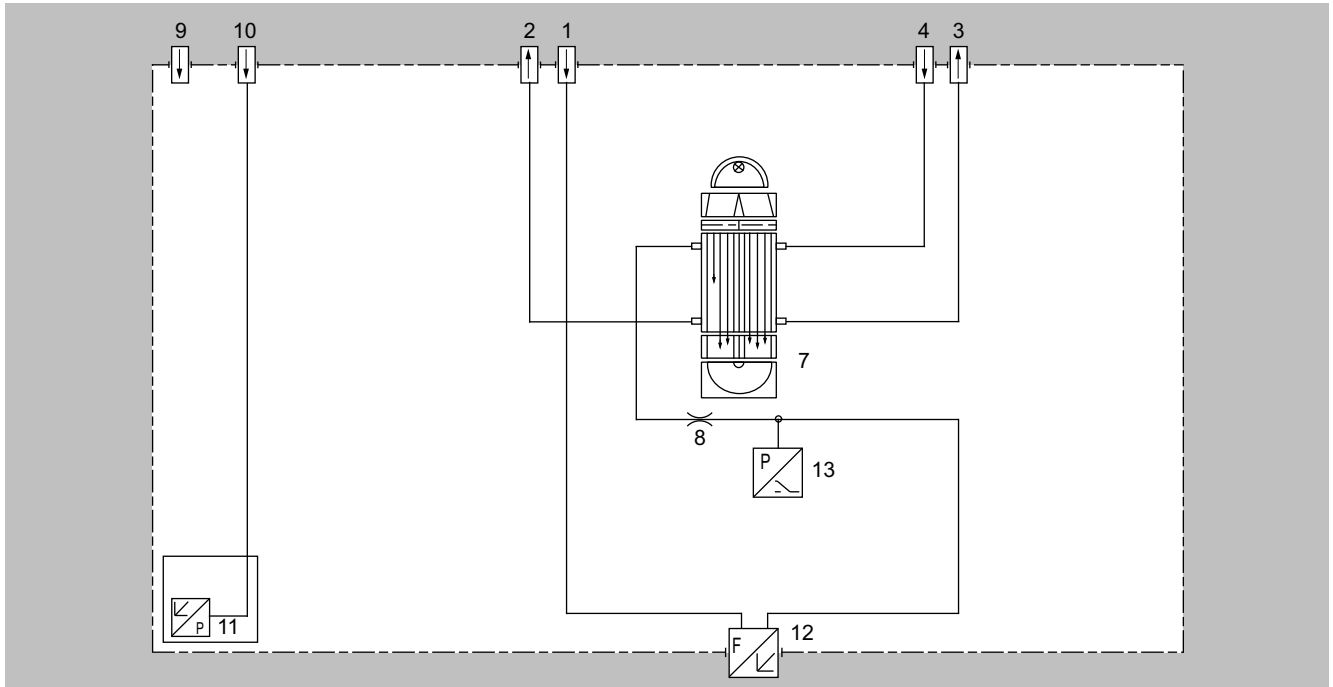
Gas path		19" rack unit	Field device	Field device Ex
Flow indicator	Measuring tube	Duran glass	-	-
	Variable area	Duran glass	-	-
	Suspension boundary	PTFE (Teflon)	-	-
	Angle units	FKM (e.g. Viton)	-	-
Pressure switch	Diaphragm	FKM (e.g. Viton)	-	-
	Enclosure	PA 6.3T	-	-

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

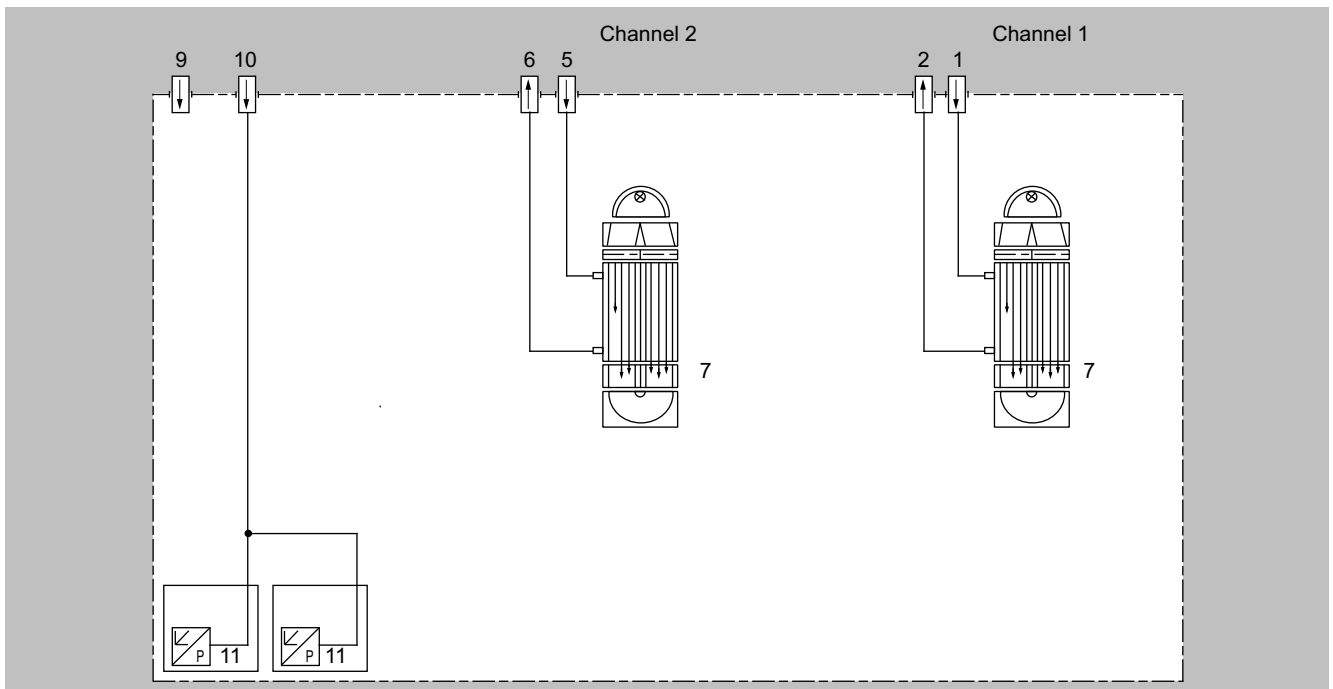
Gas path		19" rack unit	Field device	Field device Ex
With pipes	Bushing	e.g. Hastelloy C22	e.g. Hastelloy C22	e.g. Hastelloy C22
	Pipe	e.g. Hastelloy C22 O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	e.g. Hastelloy C22 O-ring: FKM (e.g. Viton) or FFKM (Kalrez)	e.g. Hastelloy C22 O-ring: FKM (e.g. Viton)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

Design (Continued)

Gas path (19" rack unit)



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



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

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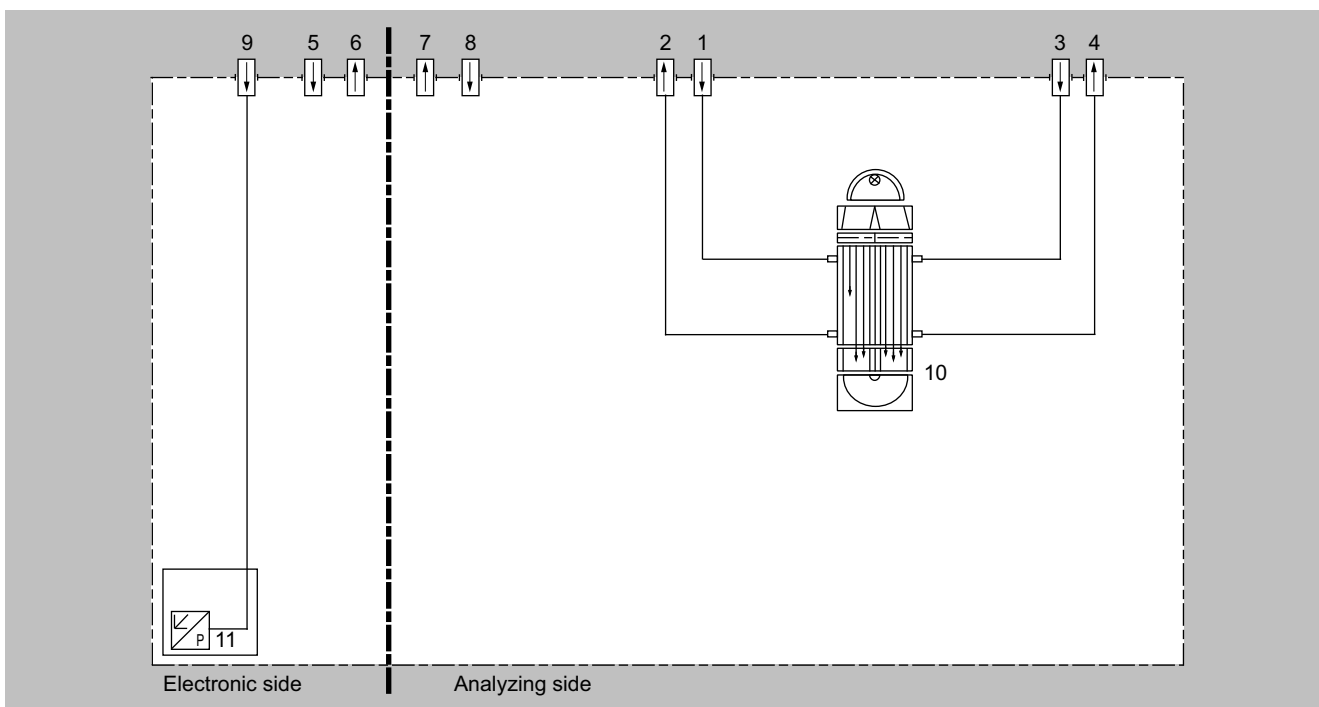
ULTRAMAT 6

Design (Continued)

Legend for the figures "Gas path (19" rack unit)"

1	Sample gas inlet channel 1	8	Restrictor
2	Sample gas outlet channel 1	9	Purging 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 (field device)



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

Legend for figure "Gas path (field device)"

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)		

Mode of operation

The ULTRAMAT 6 gas analyzer operates according to the infrared two-beam modulated 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 chamber (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 chamber 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 detector chamber layer optically. The infrared absorption in the second detector chamber 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

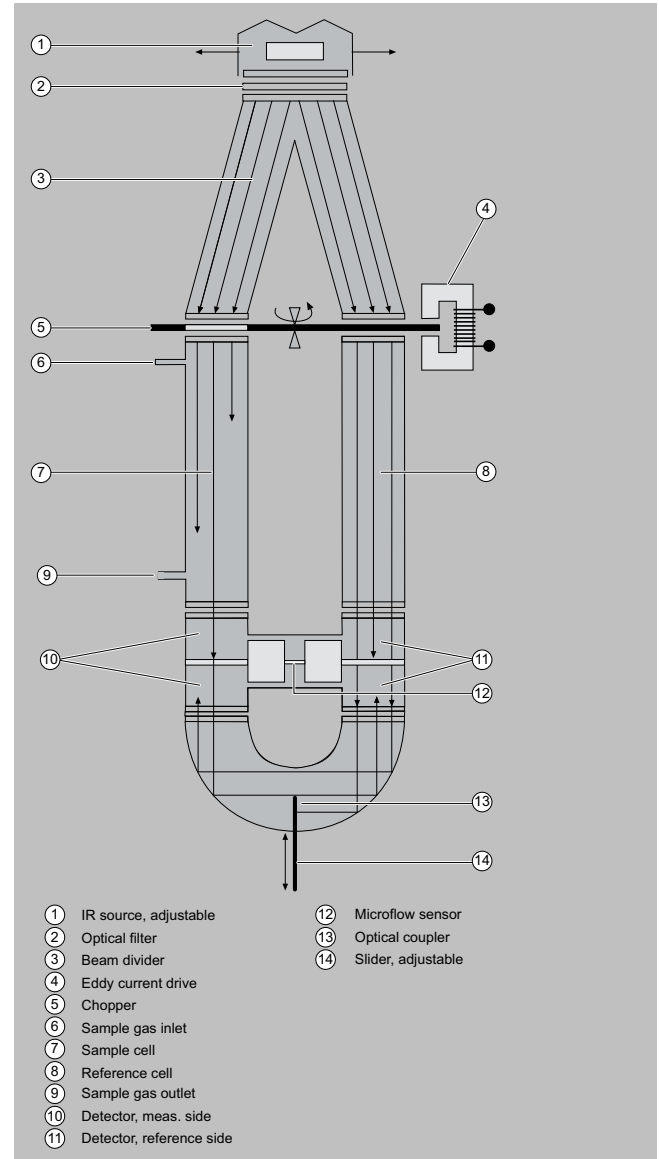
The sample gases must be fed into the analyzers free of dust. Condensation in the sample chambers must be prevented. Therefore, the use of gas modified for the measuring task is necessary in most application cases.

As far as possible, the ambient air of the analyzer unit should not have a large concentration of the gas components to be measured. Flow-type reference cells with reduced flow must not be operated with flammable or toxic gases.

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

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.

Mode of operation (Continued)



ULTRAMAT 6, principle of operation

Extractive continuous process gas analysis

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ULTRAMAT 6

Function

Main features

- 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
- Electrically isolated measured value output 0/2/4 up 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 calibration
- Wide range of selectable time constants (static/dynamic noise damping); i.e. the response time of the device or component can be adapted to the respective measuring task
- Short response time
- Low long-term drift
- Measuring point switchover for up to 6 measuring points (parameterizable)
- 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 input levels with separate authorization codes to prevent unintentional and unauthorized operator intervention
- Automatic measuring range calibration parameterizable
- Simple handling using a numerical membrane keyboard and operator prompting
- Operation based on NAMUR recommendation
- Custom-made device designs, such as:
 - Customer acceptance
 - TAG plates
 - Clean for O₂ service (specially cleaned gas path)
- Easy device replacement since electrical connections can be simply disconnected from the device
- Sample chambers for use in presence of highly corrosive sample gases, e.g. tantalum layer or sample chamber made of Hastelloy C22 (special application)

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 at the rear of the device)

Selection and ordering data

ULTRAMAT 6 gas analyzer Single-channel 19" rack unit for installation in cabinets			Article No. 7MB2121- ● ● ● ● ● - ● A A ●			
Click on the Article No. for online configuration in the PIA Life Cycle Portal.						
Unavailable combinations are shown in PIA Life Cycle Portal as "not permitted".						
Gas connections for sample gas and reference gas						
Pipe with 6 mm outer diameter					0	
Pipe with 1/4" outer diameter					1	
Measured component	Possible with measuring range identification					
CO	11 ... 30				A	
CO highly selective (with optical filter) ²⁾	12 ... 30				B	
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 ⁴⁾	12 ... 30				N	
NO ⁴⁾	14 ... 30				P	
NH ₃ (dry)	14 ... 30				Q	
H ₂ O	17 ... 22				R	
N ₂ O	13 ... 30				S	
CO ³⁾	13, 15 ... 17, 19, 23, 25, 29				X	
Smallest measuring range	Largest measuring range	Measuring range identification				
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	
Internal gas paths	Sample chamber¹⁾ (lining)	Reference chamber (flow-type)				
Hose made of FKM (Viton)	Aluminum	Non-flow-type			0	
Hose made of FKM (Viton)	Aluminum	Flow-type			1	
Hose made of FKM (Viton) with sample gas monitoring	Aluminum	Non-flow-type			2	
Hose made of FKM (Viton) with sample gas monitoring	Aluminum	Flow-type			3	
Pipe made of titanium	Tantalum	Non-flow-type			4	
Pipe made of titanium	Tantalum	Flow-type			5	
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type			6	
Stainless steel pipe (mat. no. 1.4571)	Tantalum	Non-flow-type			8	

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / 19" rack unit

Selection and ordering data (Continued)

	Article No.										
ULTRAMAT 6 gas analyzer Single-channel 19" rack unit for installation in cabinets	7	M	B	2	1	-			A	A	
Add-on electronics											
Without											0
AUTOCAL function with 8 additional digital inputs/outputs each											1
AUTOCAL function with serial interface for the automotive industry (AK)											3
AUTOCAL function with 8 digital inputs/outputs each and PROFIBUS PA interface											6
AUTOCAL function with 8 digital inputs/outputs each and PROFIBUS DP interface											7
Auxiliary power											
100 ... 120 V AC, 48 ... 63 Hz											0
200 ... 240 V AC, 48 ... 63 Hz											1
Language of the operating software											
German											0
English											1
French											2
Spanish											3
Italian											4

¹⁾ Only for cell lengths 20 to 180 mm.

²⁾ QAL1: See table "Performance tested according to EN 15267 (single component)".

³⁾ QAL1: See table "Based on QAL1 according to SIRA/MCERTS (single component)".

⁴⁾ QAL1: See tables "Based on QAL1 according to SIRA/MCERTS (single component)" and "Performance-tested according to EN 15267 (single component)".

Options	Order code
Add "-Z" to article number and then add order code	
Settings	
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
Set of Torx screwdrivers	A32
Tag plates (customized inscription)	B03
Kalrez gaskets in sample gas path	B04
SIL Declaration of Conformity (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 default 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
Hardware/software configuration conforming to QAL1 suitability test according to EN 14181:2004	Y17
Performance-tested according to EN 15267	Y27

Accessories	Article No.
RS 485/Ethernet converter	A5E00852383

Selection and ordering data (Continued)

Accessories	Article No.
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

ULTRAMAT 6 gas analyzer		Article No.	
Two-channel 19" rack unit for installation in cabinets for measuring 2 IR components		7MB2123- ● ● ● ● ● - ● ● ● ●	
Click on the Article No. for online configuration in the PIA Life Cycle Portal.			
Unavailable combinations are shown in PIA Life Cycle Portal as "not permitted".			
Gas connections for sample gas and reference gas			
Pipe with 6 mm outer diameter			0
Pipe with 1/4" outer diameter			1
Channel 1 Measured component	Possible with measuring range identification		
CO	11 ... 30		A
CO highly selective (with optical filter) ²⁾	12 ... 30		B
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 ⁴⁾	12 ... 30		N
NO ⁴⁾	14 ... 30		P
NH ₃ (dry)	14 ... 30		Q
H ₂ O	17 ... 22		R
N ₂ O	13 ... 30		S
CO ³⁾	13, 15 ... 17, 19, 23, 25, 29		X
Smallest measuring range	Largest measuring range	Measuring range identification	
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

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / 19" rack unit

Selection and ordering data (Continued)

ULTRAMAT 6 gas analyzer			Article No.			
Two-channel 19" rack unit for installation in cabinets for measuring 2 IR components			7MB2123- ● ● ● ● ● - ● ● ● ● ●			
0 ... 5%	0 ... 50%	27				T
0 ... 10%	0 ... 30%	28				U
0 ... 10%	0 ... 100%	29				V
0 ... 30%	0 ... 100%	30				W
Internal gas paths	Sample chamber¹⁾ (lining)	Reference chamber (flow-type)				
Hose made of FKM (Viton)	Aluminum	Non-flow-type				0
Hose made of FKM (Viton)	Aluminum	Flow-type				1
Hose made of FKM (Viton) with sample gas monitoring	Aluminum	Non-flow-type				2
Hose made of FKM (Viton) with sample gas monitoring	Aluminum	Flow-type				3
Pipe made of titanium	Tantalum	Non-flow-type				4
Pipe made of titanium	Tantalum	Flow-type				5
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type				6
Stainless steel pipe (mat. no. 1.4571)	Tantalum	Non-flow-type				8
Add-on electronics						
Without						0
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1						1
AUTOCAL function with 8 additional digital inputs/outputs each for channel 2						2
AUTOCAL function with 8 additional digital inputs/outputs for channel 1 and channel 2						3
AUTOCAL function with serial interface for the automotive industry (AK)						5
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS PA interface						6
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS DP interface						7
Auxiliary power						
100 ... 120 V AC, 48 ... 63 Hz						0
200 ... 240 V AC, 48 ... 63 Hz						1
Channel 2 Measured component		Possible with measuring range identification				
CO		11 ... 30				A
CO highly selective (with optical filter) ²⁾		12 ... 30				B
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 ⁴⁾		12 ... 30				N
NO ⁴⁾		14 ... 30				P
NH ₃ (dry)		14 ... 30				Q
H ₂ O		17 ... 22				R
N ₂ O		13 ... 30				S
CO ³⁾		13, 15 ... 17, 19, 23, 25, 29				X
Smallest measuring range	Largest measuring range	Measuring range identification				
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

Selection and ordering data (Continued)

ULTRAMAT 6 gas analyzer			Article No.																		
Two-channel 19" rack unit for installation in cabinets for measuring 2 IR components			7MB2123- ● ● ● ● ● - ● ● ● ● ●																		
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
Language of the operating software																					
German																				0	
English																				1	
French																				2	
Spanish																				3	
Italian																				4	

¹⁾ Only for cell lengths 20 to 180 mm.

²⁾ QAL1: See table "Performance tested according to EN 15267 (single component)".

³⁾ QAL1: See table "Based on QAL1 according to SIRA/MCERTS (single component)".

⁴⁾ QAL1: See tables "Based on QAL1 according to SIRA/MCERTS (single component)" and "Performance-tested according to EN 15267 (single component)".

Options	Order code
Add "-Z" to article number and then add order code	
Settings	
Flow-type reference cell with reduced flow, 6 mm (channel 1)	A20
Flow-type reference cell with reduced flow, ¼" (channel 1)	A21
Flow-type reference cell with reduced flow, 6 mm (channel 2)	A40
Flow-type reference cell with reduced flow, ¼" (channel 2)	A41
Connection pipes (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, ¼", complete with screwed gland, for sample gas side	A24
• Made of titanium, ¼", 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), ¼", complete with screwed gland, for sample gas side	A29
Telescopic rails (2 units)	A31
Set of Torx screwdrivers	A32
Without Siemens logo	B02
Tag plates (customized inscription)	B03
Kalrez gaskets in sample gas path (channel 1)	B04
Kalrez gaskets in sample gas path (channel 2)	B05

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / 19" rack unit

Selection and ordering data (Continued)

Options	Order code
SIL Declaration of Conformity (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, channel 1+2)	Y02
Measuring range indication in plain text, if different from default 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
Hardware/software configuration conforming to QAL1 suitability test according to EN 14181:2004 (Channel 1)	Y17
German Technical Inspectorate version according to 13th and 17th German Federal Immission Protection Regulations (channel 2)	Y18
Performance-tested according to EN 15267 (channel 1)	Y27
Performance-tested according to EN 15267 (channel 2)	Y28

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 each 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

ULTRAMAT 6 gas analyzer		Article No.									
Single-channel or dual-channel 19" rack unit for installation in cabinets for measuring 2 or 3 IR components		7MB2124-	●	●	●	●	-	●	●	●	●
Click on the Article No. for online configuration in the PIA Life Cycle Portal.											
Unavailable combinations are shown in PIA Life Cycle Portal as "not permitted".											
Gas connections for sample gas and reference gas											
Pipe with 6 mm outer diameter								0			
Pipe with 1/4" outer diameter								1			
Measured component	Smallest measuring range	Largest measuring range									
CO and NO ¹⁾	0 ... 100 vpm	0 ... 1 000 vpm							A	A	
CO and NO ¹⁾	0 ... 300 vpm	0 ... 3 000 vpm							A	B	
CO and NO ¹⁾	0 ... 1 000 vpm	0 ... 10 000 vpm							A	C	
CO ₂ and CO	0 ... 100 vpm	0 ... 1 000 vpm							B	A	
CO ₂ and CO	0 ... 300 vpm	0 ... 3 000 vpm							B	B	
CO ₂ and CO	0 ... 1 000 vpm	0 ... 10 000 vpm							B	C	
CO ₂ and CO	0 ... 3 000 vpm	0 ... 30 000 vpm							B	D	

Selection and ordering data (Continued)

ULTRAMAT 6 gas analyzer			Article No.			
Single-channel or dual-channel 19" rack unit for installation in cabinets for measuring 2 or 3 IR components			7MB2124- ● ● ● ● - ● ● ● ●			
CO ₂ and CO	0 ... 1%	0 ... 10%		B	E	
CO ₂ and CO	0 ... 3%	0 ... 30%		B	F	
CO ₂ and CO	0 ... 10%	0 ... 100%		B	G	
CO ₂ and CH ₄	0 ... 10%	0 ... 100%		C	G	
CO ₂ and NO	0 ... 300 vpm	0 ... 3 000 vpm		D	B	
Internal gas paths	Sample chamber²⁾ (lining)	Reference chamber (flow-type)				
Hose made of FKM (Viton)	Aluminum	Non-flow-type			0	
Hose made of FKM (Viton)	Aluminum	Flow-type			1	
Hose made of FKM (Viton) with sample gas monitoring	Aluminum	Non-flow-type			2	
Hose made of FKM (Viton) with sample gas monitoring	Aluminum	Flow-type			3	
Pipe made of titanium	Tantalum	Non-flow-type			4	
Pipe made of titanium	Tantalum	Non-flow-type			5	
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type			6	
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type			8	
Add-on electronics						
Without					0	
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1					1	
AUTOCAL function with 8 additional digital inputs/outputs for channel 1 and channel 2					2	
AUTOCAL function with serial interface for the automotive industry (AK), channel 1					3	
AUTOCAL function with serial interface for the automotive industry (AK), channel 1 and channel 2					4	
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1 and PROFIBUS PA interface					5	
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS PA interface					6	
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1 and PROFIBUS DP interface					7	
AUTOCAL function with 8 additional digital inputs/outputs each for channel 1 and channel 2 and PROFIBUS DP interface					8	
Auxiliary power						
100 ... 120 V AC, 48 ... 63 Hz					0	
200 ... 240 V AC, 48 ... 63 Hz					1	
Channel 2 Measured component	Possible with measuring range identification					
CO	11 ... 30					A
CO highly selective (with optical filter)	12 ... 30					B
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 ³⁾	12 ... 30					N
NO ³⁾	14 ... 23, 25, 29					P
NH ₃ (dry)	14 ... 30					Q
H ₂ O	17 ... 30					R
N ₂ O	13 ... 30					S
Without channel 2						W
CO ³⁾						X
Smallest measuring range	Largest measuring range	Measuring range identification				
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

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / 19" rack unit

Selection and ordering data (Continued)

ULTRAMAT 6 gas analyzer			Article No.																	
Single-channel or dual-channel 19" rack unit for installation in cabinets for measuring 2 or 3 IR components			7MB2124- ● ● ● ● ● - ● ● ● ● ●																	
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
Without channel 2																				X
Language of the operating software																				
German																				0
English																				1
French																				2
Spanish																				3
Italian																				4

¹⁾ QAL1: See table "Based on QAL1 according to SIRA/MCERTS (2 components in series)".

²⁾ Only for cell lengths 20 to 180 mm.

³⁾ QAL1: See table "Based on QAL1 according to SIRA/MCERTS (single component)".

Options	Order code
Add "-Z" to article number and then add order code	
Settings	
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 pipes (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 plates (customized inscription)	B03
Kalrez gaskets in sample gas path (channel 1)	B04
Kalrez gaskets in sample gas path (channel 2)	B05

Selection and ordering data (Continued)

Options	Order code
SIL Declaration of Conformity (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, channel 1+2)	Y02
Measuring range indication in plain text, if different from default 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
Hardware/software configuration conforming to QAL1 suitability test according to EN 14181:2004 (Channel 1)	Y17
Hardware/software configuration conforming to QAL1 suitability test according to EN 14181:2004 (Channel 2)	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 each 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

Note

See table QAL1 and order examples under "More information".

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / 19" rack unit

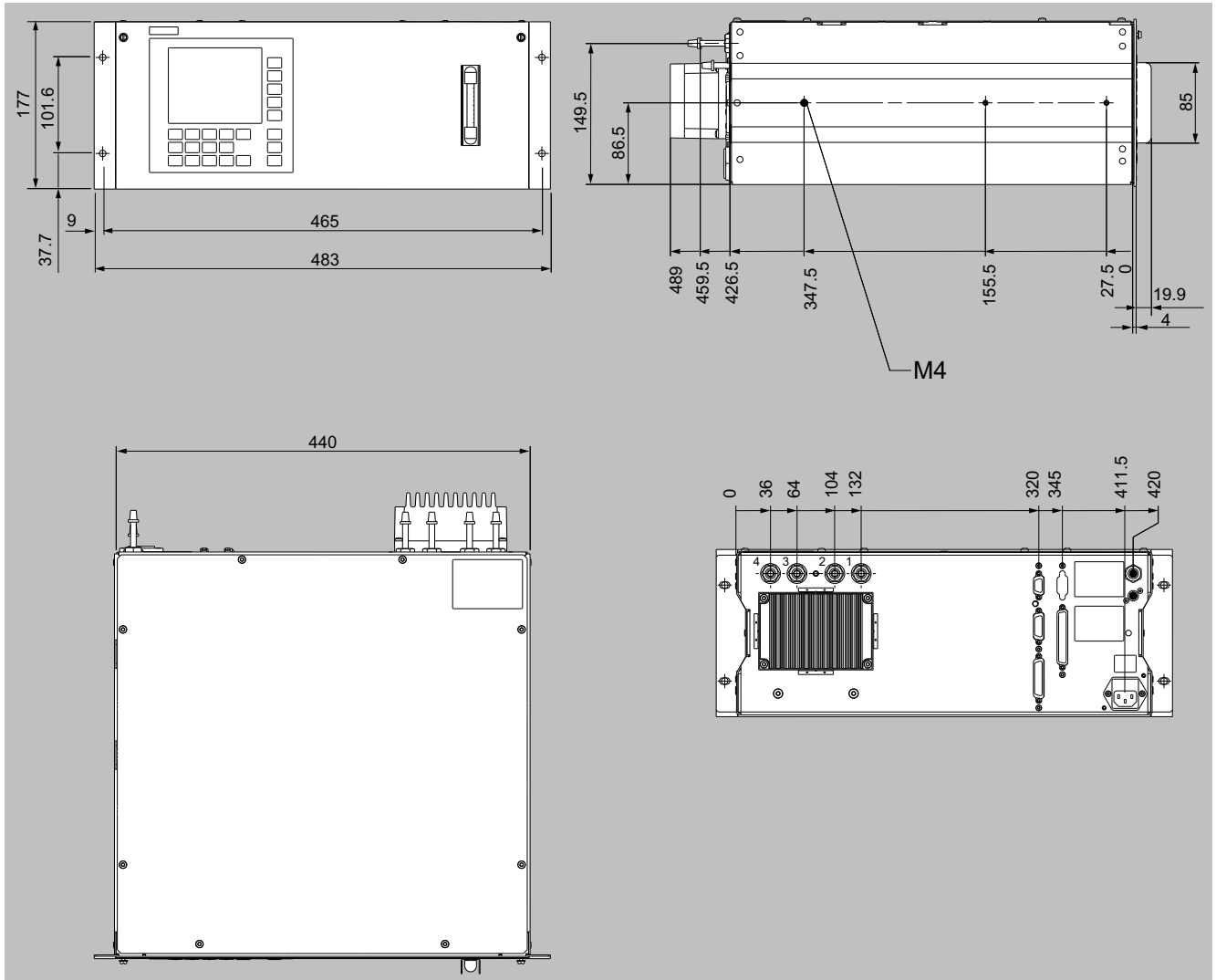
Technical specifications

ULTRAMAT 6, 19" rack unit	
General information	
Measuring ranges	4, internally and externally switchable; automatic measuring range switchover 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 interference 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
Auxiliary power	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 device: approx. 40 VA 2-channel device: approx. 70 VA
Fuse ratings	100 ... 120 V: 1T/250 (7MB2121); 1.6T/250 (7MB2123) 200 ... 240 V: 0.63T/250 (7MB2121); 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
Time 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 configurable damping
Damping (electrical time constant)	0 ... 100 s, configurable
Dead time (purging time of the gas path in the device at 1 l/min)	Approx. 0.5 ... 5 s, depending on the 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	
Based on 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 nameplate
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 measuring range end value

Technical specifications (Continued)

ULTRAMAT 6, 19" rack unit	
Influencing variables	
Based on 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"> With enabled pressure compensation: < 0.15% of the measuring span/1% change in atmospheric pressure With disabled pressure compensation: < 1.5% of the measuring span/1% change in atmospheric pressure
Sample gas flow	Negligible
Auxiliary power	< 0.1% of the current measuring range with nominal 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, floating; load ≤ 750 Ω
Relay outputs	6, with changeover contacts, freely configurable, e.g. for measuring range identification; load rating: 24 V AC/DC/1 A, floating, 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)
Digital inputs	6, designed for 24 V, floating, freely configurable, e.g. for measuring range switchover
Serial interface	RS 485
Options	AUTOCAL function each with 8 additional digital 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 (must not fall below dew point)

Dimensional drawings



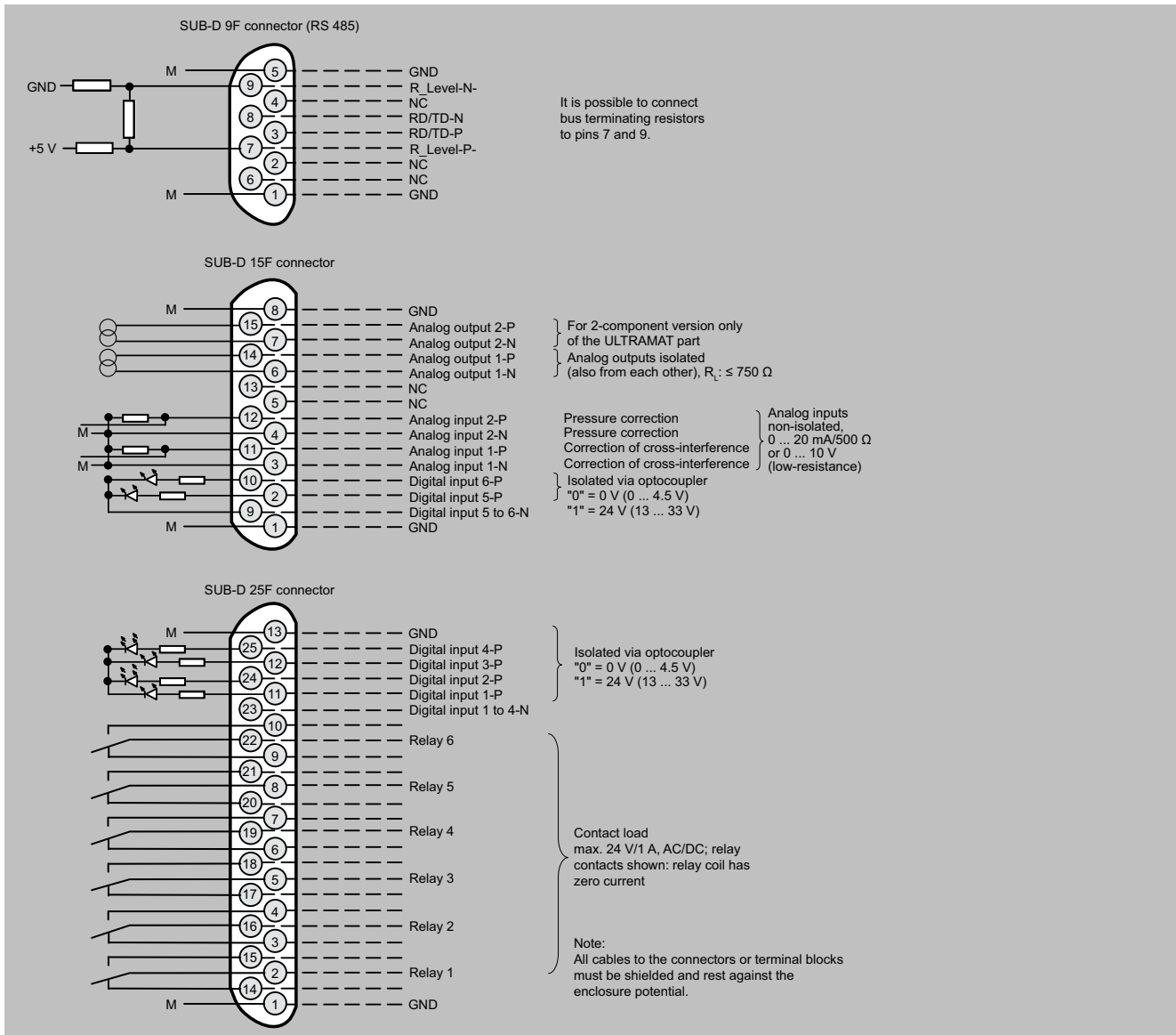
ULTRAMAT 6, 19" rack unit, dimensions in mm (example: 1-channel version)

Extractive continuous process gas analysis

Series 6

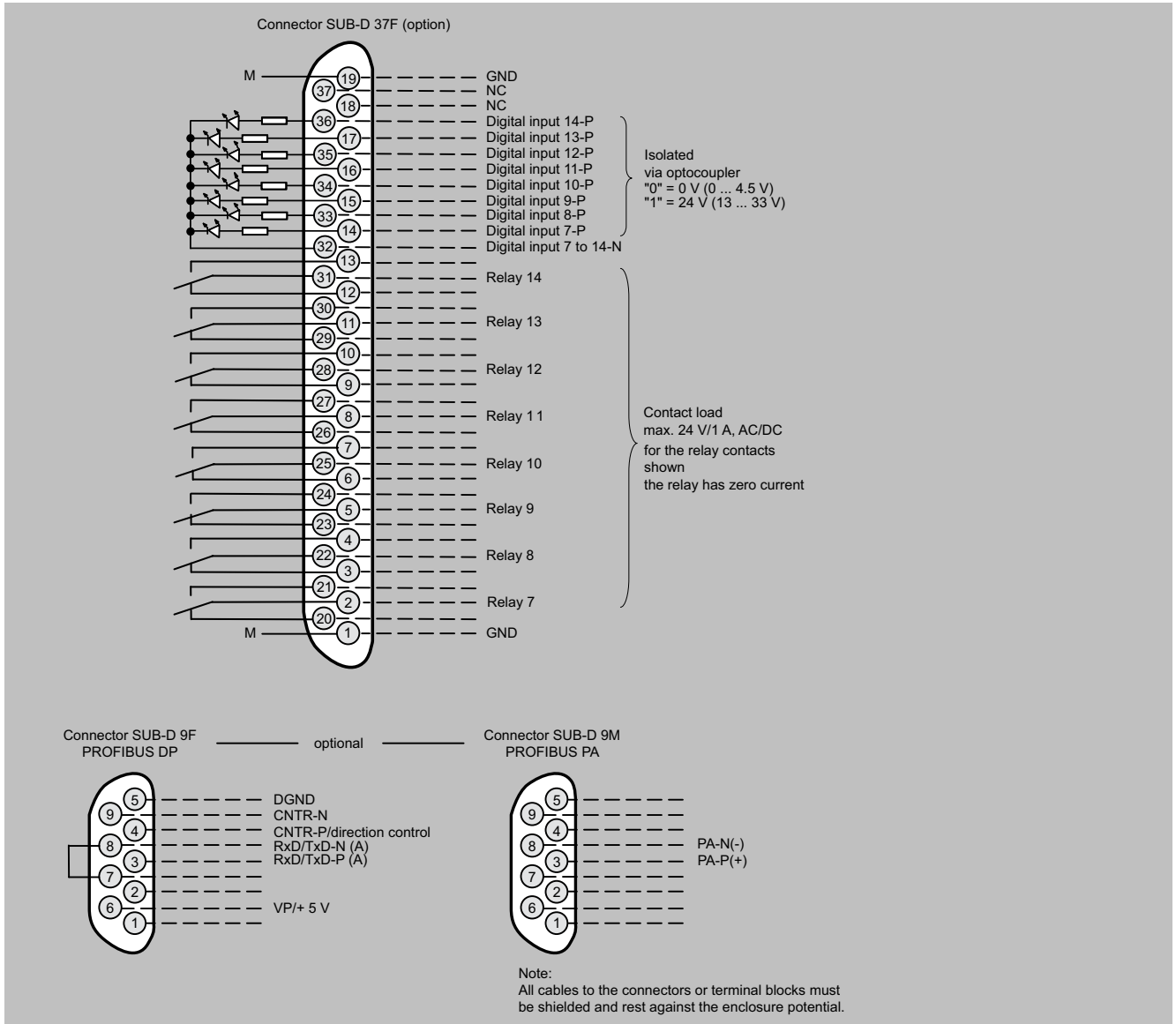
ULTRAMAT 6 / 19" rack unit

Circuit diagrams



ULTRAMAT 6, 19" rack unit, pin assignment

Circuit diagrams (Continued)



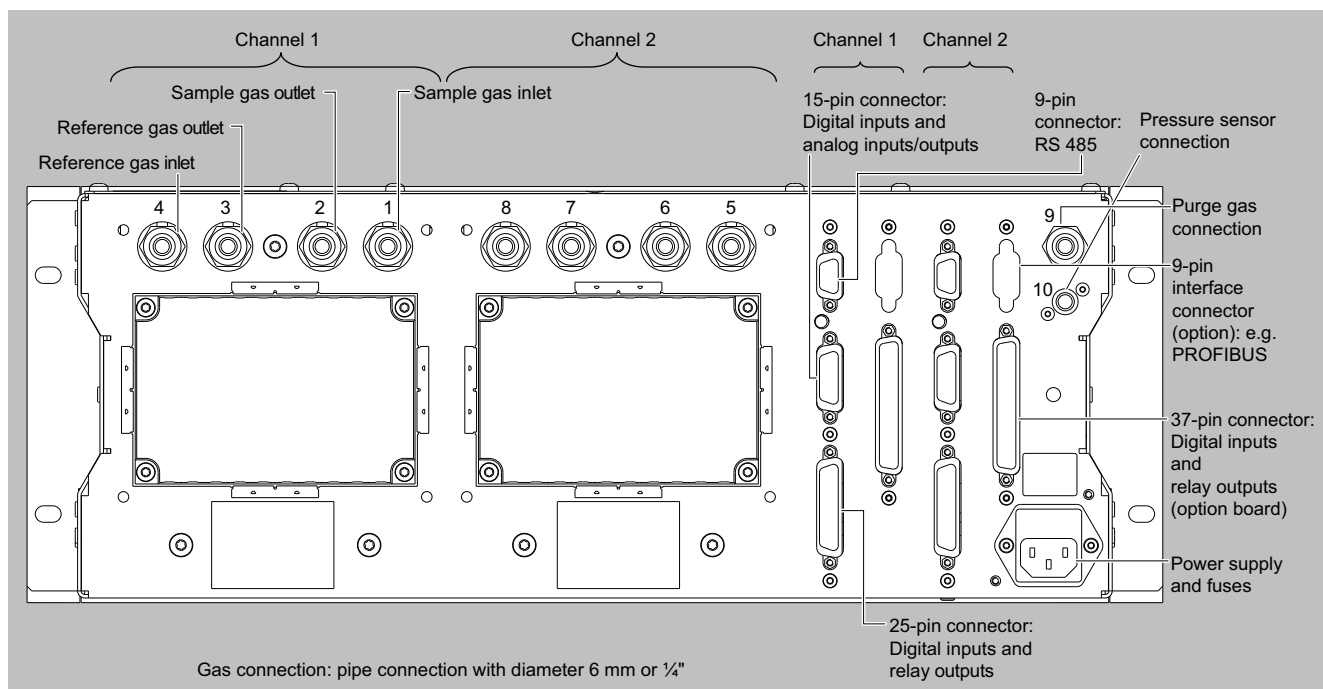
ULTRAMAT 6, 19" rack unit, pin assignment of the AUTOCAL board and PROFIBUS plugs

Extractive continuous process gas analysis

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ULTRAMAT 6 / 19" rack unit

Circuit diagrams (Continued)



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

More information

Based on QAL1 according to SIRAMCERTS (single component)

Only in conjunction with order code Y17/Y18

Component	CO (QAL1)		SO ₂ (QAL1)		NO (QAL1)	
	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

Ordering example

ULTRAMAT 6, QAL1

Component: CO

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

With hoses, non-flow-type reference cell

Without automatic adjustment (AUTOCAL)

230 V AC; German

7MB2121-0XD00-1AA0-Z +Y17

More information (Continued)**Performance-tested according to EN 15267 (single component)**

Only in conjunction with order code Y27/Y28

Component	CO (QAL1)		SO ₂ (QAL1)		NO (QAL1)	
	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	75 mg/m ³	1 250 mg/m ³	-	-	-	-
E	125 mg/m ³	1 250 mg/m ³	-	-	100 mg/m ³	2 000 mg/m ³
F	300 mg/m ³	3 000 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	-	-	1 000 mg/m ³	10 000 mg/m ³
J	3 000 mg/m ³	10 000 mg/m ³	-	-	3 000 mg/m ³	10 000 mg/m ³

Ordering example

ULTRAMAT 6 2-channel, performance-tested according to EN 15267

Components: CO + SO₂

Measuring range: CO: 0 to 75 / 1 250 mg/m³, SO₂: 0 to 75 / 1 500 mg/m³

With hoses, non-flow-type reference cell

With automatic calibration (AUTOCAL)

230 V AC; German

7MB2123-0BD03-1NC0-Z +Y27+Y28

Based on QAL1 according to SIRA/MCERTS (2 components in series)

Only in conjunction with order code Y17

Component	CO (QAL1)		NO (QAL1)	
	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

Ordering example

ULTRAMAT 6 2-channel, QAL1

Components: CO/NO + SO₂

Measuring 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 cell

Without automatic adjustment (AUTOCAL)

230 V AC; German

7MB2124-0AA00-1NC0-Z+Y17+Y18

Ordering information measured component N₂O

Certification in accordance with AM0028 and AM0034 (Kyoto Protocol) for measuring N₂O, measuring range 0 ... 300 vpm / 3 000 vpm.

Version: Standard device

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / Field device

Selection and ordering data

ULTRAMAT 6 gas analyzer			Article No.			
For installation in the field, single-channel, 1 component			7MB2111- ● ● ● ● ● - ● ● A ●			
Click on the Article No. for online configuration in the PIA Life Cycle Portal.						
Unavailable combinations are shown in PIA Life Cycle Portal as "not permitted".						
Gas connections						
Cutting ring fitting for pipe, outer diameter 6 mm					0	
Cutting ring fitting for pipe, outer diameter 1/4"					1	
Measured component			Possible with measuring range identification			
CO						A
CO highly selective (with optical filter)						B
CO ₂						C
CH ₄						D
C ₂ H ₂						E
C ₂ H ₄						F
C ₂ H ₆						G
C ₃ H ₆						H
C ₃ H ₈						J
C ₄ H ₆						K
C ₄ H ₁₀						L
C ₆ H ₁₄						M
SO ₂ ¹⁾						N
NO ¹⁾						P
NH ₃ (dry)						Q
H ₂ O						R
N ₂ O						S
CO ¹⁾						X
Smallest measuring range	Largest measuring range	Measuring range identification				
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
Internal gas paths	Sample chamber (lining)	Reference chamber (flow-type)				
Hose made of FKM (Viton)	Aluminum	Non-flow-type				0
Hose made of FKM (Viton)	Aluminum	Flow-type				1
Pipe made of titanium	Tantalum ²⁾	Non-flow-type				2
Pipe made of titanium	Tantalum ²⁾	Flow-type				3
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type				6
Stainless steel pipe (mat. no. 1.4571)	Tantalum ²⁾	Non-flow-type				8
Add-on electronics						
Without						0
AUTOCAL function with 8 additional digital inputs/outputs each						1
AUTOCAL function 8 additional digital inputs/outputs and PROFIBUS PA interface						6

Selection and ordering data (Continued)

ULTRAMAT 6 gas analyzer			Article No.																		
For installation in the field, single-channel, 1 component			7MB2111- ● ● ● ● ● - ● ● A ●																		
AUTOCAL function with 8 additional digital inputs/outputs and PROFIBUS DP interface													7								
AUTOCAL function with 8 additional digital inputs/outputs and PROFIBUS PA Ex i													8								
Auxiliary power																					
Standard device acc. to ATEX II 3G version (Zone 2)																					
• 100 ... 120 V AC, 48 ... 63 Hz																				0	
• 200 ... 240 V AC, 48 ... 63 Hz																				1	
ATEX II 2G versions (Zone 1), including certificate																					
• 100 ... 120 V AC, 48 ... 63 Hz, according to ATEX II 2G ³⁾ (operation mode: leakage compensation)																					2
• 200 ... 240 V AC, 48 ... 63 Hz, according to ATEX II 2G ³⁾ (operation mode: leakage compensation)																					3
• 100 ... 120 V AC, 48 ... 63 Hz, according to ATEX II 2G ³⁾ (operation mode: continuous purging)																					6
• 200 ... 240 V AC, 48 ... 63 Hz, according to ATEX II 2G ³⁾ (operation mode: continuous purging)																					7
Heating of internal gas paths and analyzer unit																					
Without																					A
With (max. 65 °C)																					B
Language of the operating software																					
German																					0
English																					1
French																					2
Spanish																					3
Italian																					4

¹⁾ QAL1: See table "Based on QAL1 according to SIRAMCERTS (single component)" under "More information".

¹⁾ Only for cell lengths 20 to 180 mm

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

ULTRAMAT 6 gas analyzer			Article No.																		
For installation in the field, single-channel, 2 components			7MB2112- ● ● ● ● ● - ● ● A ●																		
Click on the Article No. for online configuration in the PIA Life Cycle Portal.																					
Unavailable combinations are shown in PIA Life Cycle Portal as "not permitted".																					
Gas connections																					
Cutting ring fitting for pipe, outer diameter 6 mm													0								
Cutting ring fitting for pipe, outer diameter 1/4"													1								
Measured component	Smallest measuring range	Largest measuring range																			
CO and NO ³⁾	0 ... 100 vpm	0 ... 1 000 vpm																			A A
CO and NO ³⁾	0 ... 300 vpm	0 ... 3 000 vpm																			A B
CO and NO ³⁾	0 ... 1 000 vpm	0 ... 10 000 vpm																			A C
CO ₂ and CO	0 ... 100 vpm	0 ... 1 000 vpm																			B A
CO ₂ and CO	0 ... 300 vpm	0 ... 3 000 vpm																			B B
CO ₂ and CO	0 ... 1 000 vpm	0 ... 10 000 vpm																			B C
CO ₂ and CO	0 ... 3 000 vpm	0 ... 30 000 vpm																			B D
CO ₂ and CO	0 ... 1%	0 ... 10%																			B E
CO ₂ and CO	0 ... 3%	0 ... 30%																			B F
CO ₂ and CO	0 ... 10%	0 ... 100%																			B G
CO ₂ and CH ₄	0 ... 10%	0 ... 100%																			C G
CO ₂ and NO	0 ... 100 vpm	0 ... 1 000 vpm																			D A
CO ₂ and NO	0 ... 300 vpm	0 ... 3 000 vpm																			D B
Internal gas paths	Sample chamber (lining)	Reference chamber (flow-type)																			
Hose made of FKM (Viton)	Aluminum	Non-flow-type																			0
Hose made of FKM (Viton)	Aluminum	Flow-type																			1
Pipe made of titanium	Tantalum ¹⁾	Non-flow-type																			2
Pipe made of titanium	Tantalum ¹⁾	Flow-type																			3
Stainless steel pipe (mat. no. 1.4571)	Aluminum	Non-flow-type																			6
Stainless steel pipe (mat. no. 1.4571)	Tantalum ¹⁾	Non-flow-type																			8
Add-on electronics																					
Without																					0

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / Field device

Selection and ordering data (Continued)

	Article No.										
	7	M	B	2	1	1	2	-	0	A	
ULTRAMAT 6 gas analyzer For installation in the field, single-channel, 2 components											
AUTOCAL function with 8 additional digital inputs/outputs each									1		
AUTOCAL function 8 additional digital inputs/outputs and PROFIBUS PA interface									6		
AUTOCAL function with 8 additional digital inputs/outputs and PROFIBUS DP interface									7		
AUTOCAL function with 8 additional digital inputs/outputs and PROFIBUS PA Ex i									8		
Auxiliary power											
Standard device acc. to ATEX II 3G version (Zone 2)											
• 100 ... 120 V AC, 48 ... 63 Hz										0	
• 200 ... 240 V AC, 48 ... 63 Hz										1	
ATEX II 2G versions (Zone 1), including certificate											
• 100 ... 120 V AC, 48 ... 63 Hz, according to ATEX II 2G ²⁾ (operation mode: continuous purging)										6	
• 200 ... 240 V AC, 48 ... 63 Hz, according to ATEX II 2G ²⁾ (operation mode: continuous purging)										7	
Heating of internal gas paths and analyzer unit											
Without											A
With (max. 65 °C)											B
Language (supplied documentation, software)											
German											0
English											1
French											2
Spanish											3
Italian											4

¹⁾ Only for cell lengths 20 to 180 mm

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

³⁾ QAL1: See table "Based on QAL1 according to SIRAMCERTS (2 components in series)" under "More information".

Options	Order code
Add "-Z" to article number and then add order code	
Settings	
Flow-type reference cell with reduced flow, 6 mm	A28
Flow-type reference cell with reduced flow, 1/4"	A29
Set of Torx screwdrivers	A32
Tag plates (customized inscription)	B03
Kalrez gaskets in sample gas path	B04
SIL Declaration of Conformity (SIL 2) Functional Safety according to IEC 61508 and IEC 61511	C20
Ex versions	
For combination options see "Ex configurations – principle selection criteria series 6" table, "General information" section	
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 hazardous zone acc. to ATEX II 3G, non-flammable gases ¹⁾	E41
• In hazardous zone acc. to ATEX II 3G, flammable gases	E42

Selection and ordering data (Continued)

Options	Order code
BARTEC Ex p purging unit for use in ATEX or IECEx Zone 1 • BARTEC Ex p control unit for continuous flow • BARTEC Ex e control station with bypass key switch	E74
BARTEC Ex purging unit for use in ATEX or IECEx Zone 1 • BARTEC Ex p control unit for continuous flow • BARTEC Ex control station with bypass key switch • Operator display for visualization of system states	E75
Clean for O ₂ service (specially cleaned gas path)	Y02
Measuring range indication in plain text, if different from default 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
Hardware/software configuration conforming to QAL1 suitability test according to EN 14181:2004	Y17

¹⁾ Only in connection with an approved purging unit

Additional units for Ex versions	Article No.
ATEX Category II 2G (Zone 1)	
BARTEC Ex p purging unit for use in ATEX or IECEx Zone 1 • BARTEC Ex p control unit for continuous flow • BARTEC Ex control station with bypass key switch	7MB8000-7CA
• BARTEC Ex p control unit for continuous flow • BARTEC Ex control station with bypass key switch • Operator display for visualization of system states	7MB8000-7CB
Ex isolating relay, 230 V	7MB8000-4AA
Ex isolating relay, 110 V	7MB8000-4AB
EX isolation amplifier	7MB8000-3AB
Differential pressure switch for corrosive and non-corrosive gases	7MB8000-5AA
Stainless steel flame arrestor	7MB8000-6BA
Hastelloy flame arrestor	7MB8000-6BB
ATEX Category II 3G (Zone 2)	
BARTEC Ex p purging unit for use in ATEX or IECEx Zone 1 • BARTEC Ex p control unit for continuous flow • BARTEC Ex control station with bypass key switch	7MB8000-7CA
• BARTEC Ex p control unit for continuous flow • BARTEC Ex control station with bypass key switch • Operator display for visualization of system states	7MB8000-7CB
FM/CSA (Class I Div 2)	
Ex purging unit MiniPurge FM	7MB8000-1AA

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ULTRAMAT 6 / Field device

Selection and ordering data (Continued)

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

Note

See table QAL1 and order examples under "More information".

Technical specifications

ULTRAMAT 6, field device	
General information	
Measuring ranges	4, internally and externally switchable; automatic measuring range switchover 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 interference gases must be considered separately	
Design, enclosure	
Weight	Approx. 32 kg
Degree of protection	IP65 in accordance with EN 60529, restricted breathing enclosure according to EN 50021
Electrical characteristics	
Auxiliary power	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 devices	Overvoltage category II
• Unheated devices	Overvoltage category III
Fuse ratings (unheated device)	100 ... 120 V: F3 1T/250; F4 1T/250 200 ... 240 V: F3 0.63T/250; F4 0.63T/250
Fuse ratings (heated device)	100 ... 120 V: F1 1T/250; F2 4T/250, F3 4T/250; F4 4T/250 200 ... 240 V: F1 0.63T/250; F2 2.5T/250; F3 2.5T/250; F4 2.5T/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)

Technical specifications (Continued)

ULTRAMAT 6, field device	
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
Time 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 configurable damping
Damping (electrical time constant)	0 ... 100 s, configurable
Dead time (purging time of the gas path in the device at 1 l/min)	Approx. 0.5 ... 5 s, depending on the 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	
Output signal fluctuation	< ± 1% of the smallest possible measuring range according to nameplate
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 measuring range end value
Influencing variables	
Ambient temperature	< 1% of current measuring range/10 K (with constant receiver cell temperature)
Sample gas pressure	With enabled pressure compensation: < 0.15% of the setpoint/1% change in atmospheric pressure
Sample gas flow	Negligible
Auxiliary power	< 0.1% of the current measuring range with nominal voltage ± 10%

Technical specifications (Continued)

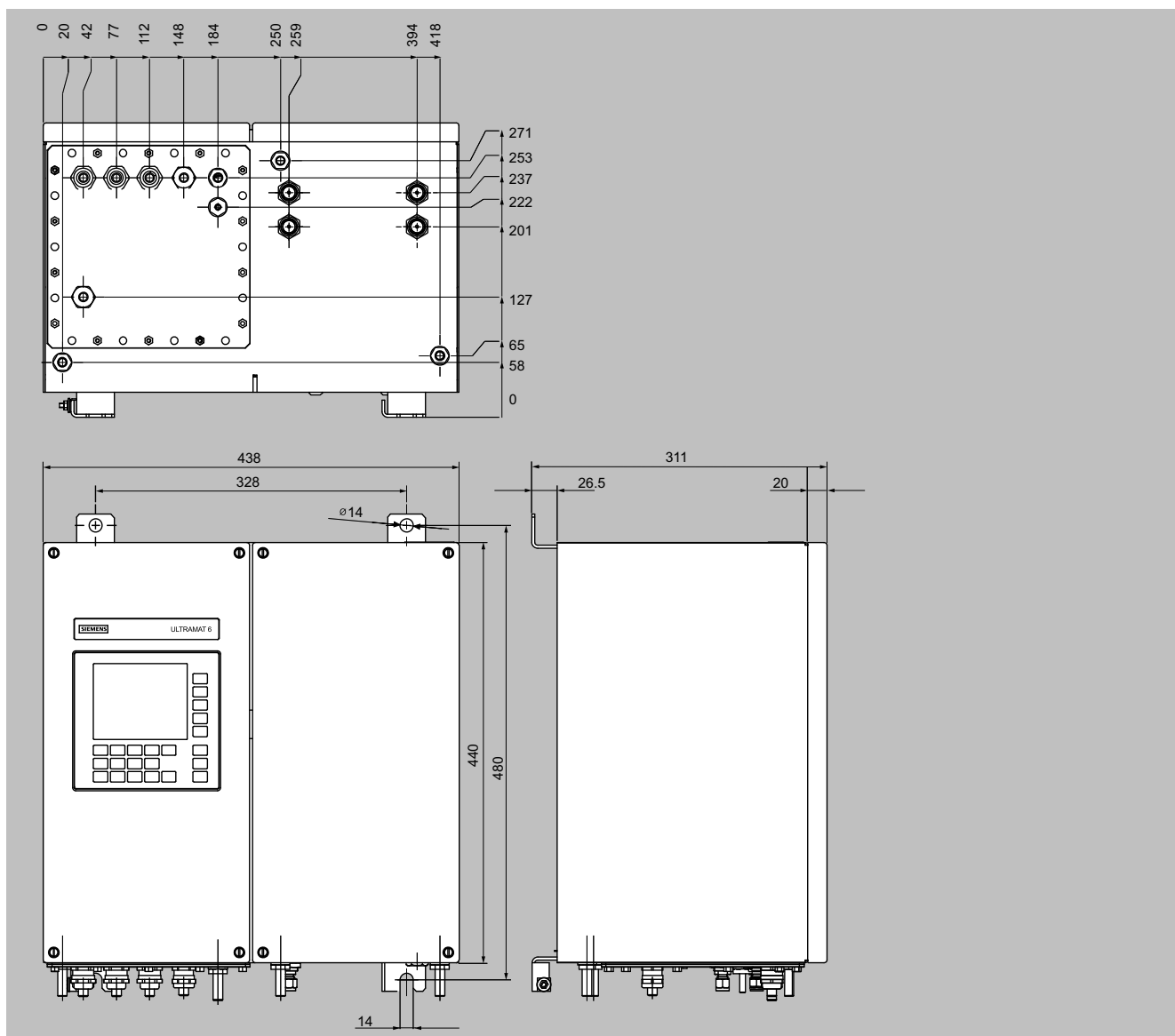
ULTRAMAT 6, field device	
Environmental conditions	Application-specific measuring influences possible if ambient air contains measured component or cross interference-sensitive gases
Electrical inputs and outputs	
Analog output	0/2/4 ... 20 mA, floating; load 750 Ω
Relay outputs	6, with changeover contacts, freely configurable, e.g. for measuring range identification; load rating: 24 V AC/DC/1 A, floating, 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)
Digital inputs	6, designed for 24 V, floating, freely configurable, e.g. for measuring range switchover
Serial interface	RS 485
Options	AUTOCAL function each with 8 additional digital 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 (must not fall below dew point)

Extractive continuous process gas analysis

Series 6

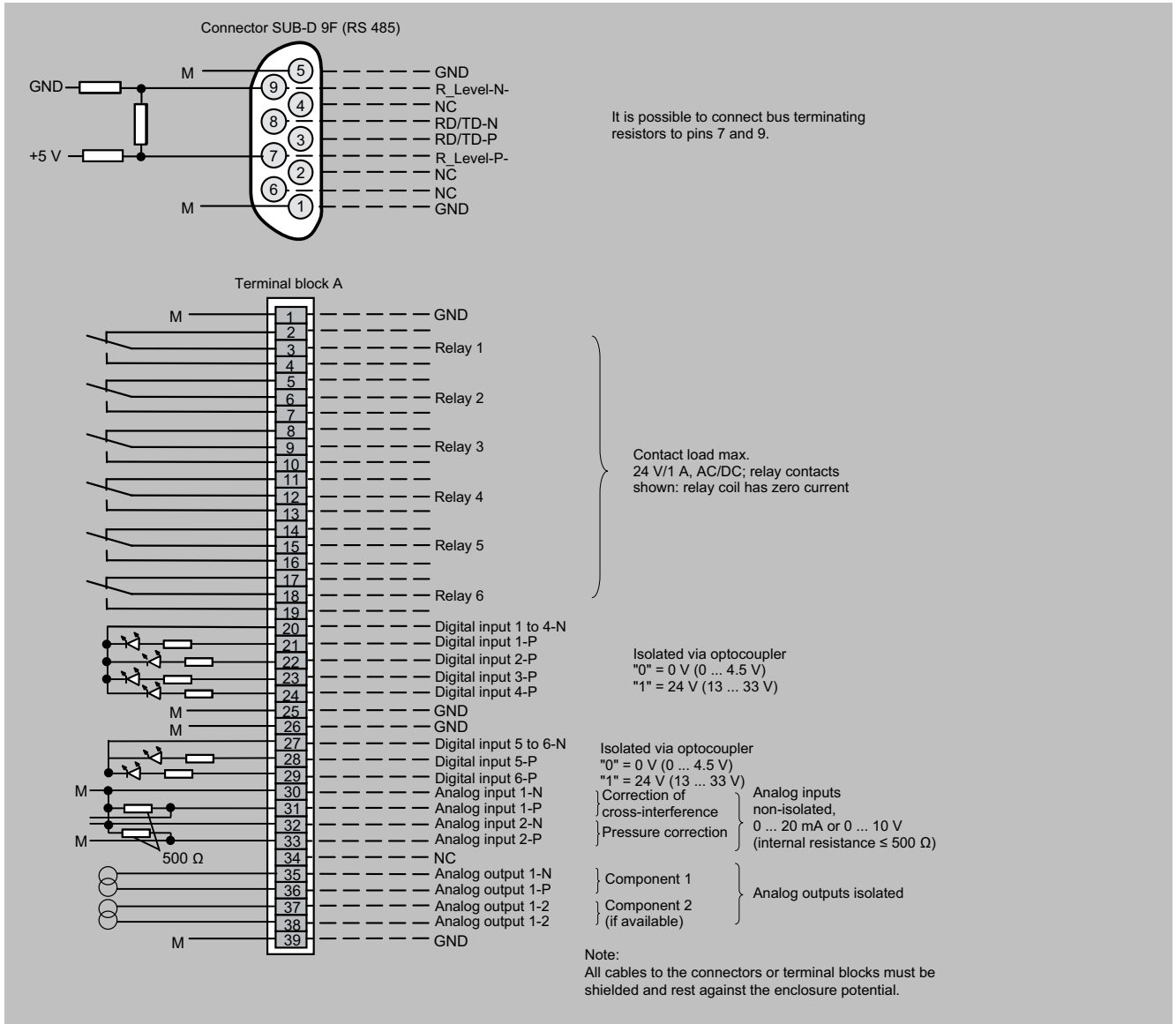
ULTRAMAT 6 / Field device

Dimensional drawings



ULTRAMAT 6, field unit, dimensions in mm

Circuit diagrams



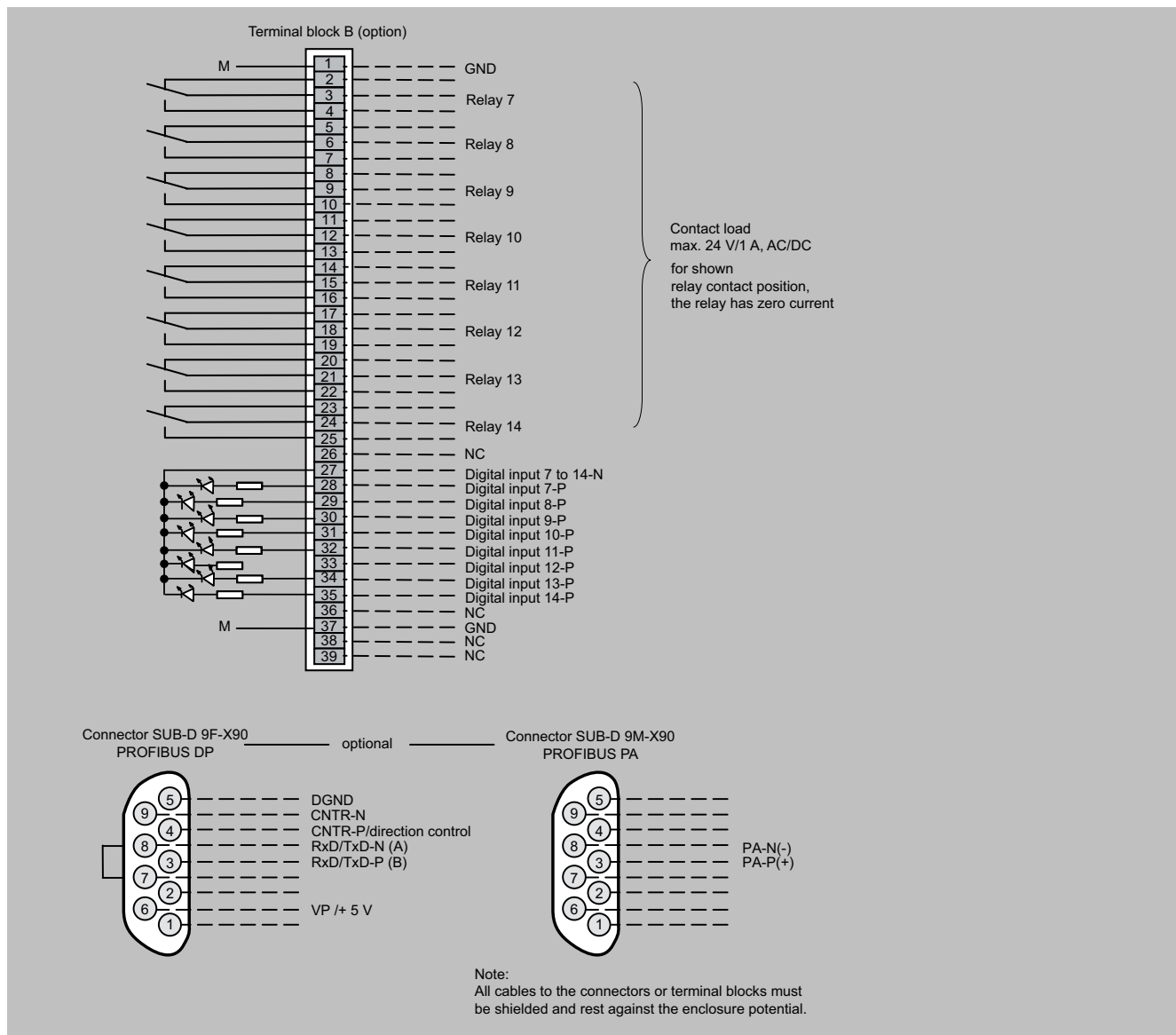
ULTRAMAT 6, field device, pin and terminal assignment

Extractive continuous process gas analysis

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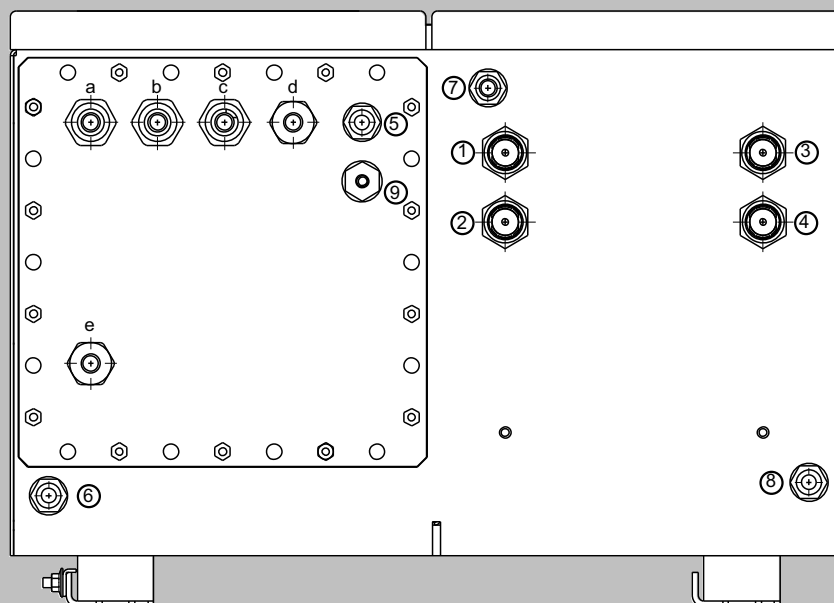
ULTRAMAT 6 / Field device

Circuit diagrams (Continued)



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

Circuit diagrams (Continued)



Gas connections

- | | | |
|-------|--|---|
| ① | Sample gas inlet | } Clamping gland for pipe
Ø 6 mm or 1/4" |
| 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 1/4" | |

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

More information

Based on QAL1 according to SIRAMCERTS (single component)

Only with additional suffix Z (Y17, Y18)

Component	CO (QAL1)		SO ₂ (QAL1)		NO (QAL1)	
	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

Ordering example

ULTRAMAT 6, QAL1 (1-component unit)
Component: CO
Measuring range: 0 to 50 / 1 000 mg/m³
With hoses, non-flow-type reference cell

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / Field device

More information (Continued)

Without automatic adjustment (AUTOCAL)
230 V AC; Without heating, German
7MB2111-0XD00-1AA0-Z +Y17

Based on QAL1 according to SIRAMCERTS (2 components in series)

Component	CO (QAL1)		NO (QAL1)	
	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

Ordering example

ULTRAMAT 6, QAL1 (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 cell

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 N₂O

Certification in accordance with AM0028 and AM0034 (Kyoto Protocol) for measuring N₂O, measuring range 0 to 300 vpm/3 000 vpm.

Version: Standard device.

Extractive continuous process gas analysis

Series 6

ULTRAMAT 6 / Suggestion for spare parts

Selection and ordering data

Description	7MB2121	7MB2123	7MB2124	7MB2111	7MB2112	7MB2111/- 2 Ex	2 years (unit)	5 years (unit)	Article No.
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-D50-1
Sample gas path									
O-ring (hose gland)				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 gland	x	x	x	x	x	x		1	C79451-A3478-C9
Heating cartridge (heated device)				x	x	x		1	W75083-A1004-F12-0
Electronics									
Temperature fuse (heated device)				x	x			1	W75054-T1001-A15-0
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 device)				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	A5E31474846
Plug-in 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-T63-0
Fusible element, T 1 A/250 V	x	x	x	x	x	x	2	3	W79054-L1011-T10-0
Fusible element, T 1.6 A/250 V		x	x				2	3	W79054-L1011-T16-0
Fusible element, T 2.5 A/250 V				x	x	x	2	3	W79054-L1011-T25-0

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

More information

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