

**Selection and ordering data**

**Order No.**

**ULTRAMAT/OXYMAT 6 gas analyzer**

19" rack unit for installation in cabinets  
 Combined measurement of IR-absorbing gas and O<sub>2</sub>

7MB2023- [ ] - [ ]

Cannot be combined

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

Smallest possible span O<sub>2</sub>

0.5% reference gas pressure 3 000 hPa  
 0.5% reference gas pressure 100 hPa (external pump)  
 2% reference gas pressure 3 000 hPa  
 2% reference gas pressure 100 hPa (external pump)  
 5% reference gas pressure 3 000 hPa  
 5% reference gas pressure 100 hPa (external pump)

A  
 B  
 C  
 D  
 E  
 F

B B → A26, Y02  
 D D → A26, Y02  
 F F → A26, Y02

Sample chamber (OXYMAT channel)

Non-flow-type compensation branch  
 • Made of stainless steel, mat. no. 1.4571  
 • Made of tantalum

A  
 B

Flow-type compensation branch  
 • Made of stainless steel, mat. no. 1.4571  
 • Made of tantalum

C  
 D

C  
 D

Internal gas paths

Sample chamber<sup>1)</sup>  
 (lining) (ULTRAMAT  
 channel)

Reference chamber  
 (flow-type) (ULTRAMAT  
 channel)

Hose made of FKM  
 (Viton)

Aluminum  
 Aluminum

Non-flow-type  
 Flow-type

0  
 1

0 0 → A20, A21  
 1

Pipe made of titanium

Tantalum  
 Tantalum

Non-flow-type  
 Flow-type

4  
 5

4 → A20, A21, Y02  
 5 → Y02

Stainless steel pipe  
 (mat. no. 1.4571)

Aluminum  
 Tantalum

Non-flow-type  
 Non-flow-type

6  
 8

6 → A20, A21  
 8 → A20, A21

With sample gas monitoring (both channels)

Hose made of FKM  
 (Viton)

Aluminum  
 Aluminum

Non-flow-type  
 Flow-type

2  
 3

2 2 → A20, A21  
 3

Add-on electronics

Without  
 AUTOCAL function  
 • With 8 additional binary inputs and outputs for OXYMAT channel  
 • With 8 additional binary inputs and outputs for ULTRAMAT channel  
 • With 8 additional binary inputs and 8 additional binary outputs for ULTRAMAT channel and OXYMAT channel  
 • With serial interface for the automotive industry (AK)  
 • With 8 additional binary inputs/outputs and PROFIBUS PA interface for ULTRAMAT channel and OXYMAT channel  
 • With 8 additional binary inputs/outputs and PROFIBUS DP interface for ULTRAMAT channel and OXYMAT channel

0  
 1  
 2  
 3  
 5  
 6  
 7

5 → Y02

Power supply

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

0  
 1

Footnotes, see next page

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<u>ULTRAMAT channel</u>	<u>Possible with measuring range identification</u>
<u>Measured component</u>	
CO	11 <sup>2)</sup> , 12 ... 30
CO highly selective (with optical filter)	12 <sup>2)</sup> , 13 ... 30
CO (TÜV; see Table "TÜV, single component (IR channel)", Page 2/8)	
CO <sub>2</sub>	10 <sup>2)</sup> , 11 ... 30
CH <sub>4</sub>	13 <sup>2)</sup> , 14 ... 30
C <sub>2</sub> H <sub>2</sub>	15 <sup>2)</sup> , 16 ... 30
C <sub>2</sub> H <sub>4</sub>	15 <sup>2)</sup> , 16 ... 30
C <sub>2</sub> H <sub>6</sub>	14 <sup>2)</sup> , 15 ... 30
C <sub>3</sub> H <sub>6</sub>	14 <sup>2)</sup> , 15 ... 30
C <sub>3</sub> H <sub>8</sub>	13 <sup>2)</sup> , 14 ... 30
C <sub>4</sub> H <sub>6</sub>	15 <sup>2)</sup> , 16 ... 30
C <sub>4</sub> H <sub>10</sub>	14 <sup>2)</sup> , 15 ... 30
C <sub>6</sub> H <sub>14</sub>	14 <sup>2)</sup> , 15 ... 30
SO <sub>2</sub> (TÜV; see Table "TÜV, single component (IR channel)", Page 2/8)	13 <sup>2)</sup> , 14 ... 30
NO (TÜV; see Table "TÜV, single component (IR channel)", Page 2/8)	14 <sup>2)</sup> , 15 ... 20, 22
NH <sub>3</sub> (dry)	14 <sup>2)</sup> , 15 ... 30
H <sub>2</sub> O	17 <sup>2)</sup> , 18 ... 20, 22
N <sub>2</sub> O	13 <sup>2)</sup> , 14 ... 30

<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

Operating software and documentation

German	0
English	1
French	2
Spanish	3
Italian	4

1) Only for cell length 20 to 180 mm

2) Can be ordered as special application (no. 3100 with order code Y12)

A vertical bar with colored segments and letters A through W. The segments are: green (A-S), grey (T), green (U-V), and grey (W).

A vertical bar with a grey background and a vertical line. It contains the letters Q and R.

## Selection and ordering data

<i>Additional versions</i>	<b>Order code</b>	Cannot be combined
Add "-Z" to Order No. and specify order codes.		
Flow-type reference cell with reduced flow, 6 mm (ULTRAMAT channel) <sup>1)</sup>	<b>A20</b>	
Flow-type reference cell with reduced flow, 1/4" (ULTRAMAT channel) <sup>1)</sup>	<b>A21</b>	
Reference gas monitoring (pressure switch ... 3 000 hPa), for OXYMAT channel only	<b>A26</b>	
Connection pipes (can only be combined with the appropriate gas connection diameter and internal gas path materials)		
• Titanium connection pipe, 6 mm, complete with screwed gland, for sample gas side	<b>A22</b>	
• Titanium connection pipe, 1/4", complete with screwed gland, for sample gas side	<b>A24</b>	
• Stainless steel connection pipe (mat. no. 1.4571), 6 mm, complete with screwed gland, for sample gas side	<b>A27</b>	
• Stainless steel connection pipe (mat. no. 1.4571), 1/4", complete with screwed gland, for sample gas side	<b>A29</b>	
Telescopic rails (2 units)	<b>A31</b>	
Set of Torx screwdrivers	<b>A32</b>	
Kalrez gaskets in sample gas path (O <sub>2</sub> side)	<b>B01</b>	
TAG labels (specific inscription based on customer information)	<b>B03</b>	
Kalrez gaskets in sample gas path (IR side)	<b>B04</b>	
FM/CSA certificate – Class I Div 2	<b>E20</b>	
Clean for O <sub>2</sub> service (specially cleaned gas path) (ULTRAMAT channel and OXYMAT channel)	<b>Y02</b>	
Measuring range data in plain text <sup>2)</sup> , if different from the standard setting	<b>Y11</b>	
Special setting (only in conjunction with an application no., e.g. extended measuring range, only ULTRAMAT channel)	<b>Y12</b>	
Extended special setting (only in conjunction with an application no., e.g. determination of interference influences, only ULTRAMAT channel)	<b>Y13</b>	
TÜV version acc. to 13th and 17th BImSchV (only ULTRAMAT channel)	<b>Y17</b>	<b>E20</b>

### *Retrofitting sets*

	<b>Order No.</b>	
RS 485/Ethernet converter	<b>A5E00852383</b>	
RS 485/RS 232 converter	<b>C79451-Z1589-U1</b>	
RS 485/USB converter	<b>A5E00852382</b>	
AUTOCAL function with serial interfaces for the automotive industry (AK)	<b>C79451-A3480-D33</b>	
AUTOCAL function with 8 binary inputs/outputs for ULTRAMAT channel or OXYMAT channel	<b>C79451-A3480-D511</b>	
AUTOCAL function with 8 binary inputs/outputs and PROFIBUS PA for ULTRAMAT channel or OXYMAT channel	<b>A5E00057307</b>	
AUTOCAL function with 8 binary inputs/outputs and PROFIBUS DP for ULTRAMAT channel or OXYMAT channel	<b>A5E00057312</b>	

<sup>1)</sup> Cannot be combined with non-flow-type reference cell.

<sup>2)</sup> Standard setting: 

Smallest measuring range	}	in % or
25% of largest measuring range		
50% of largest measuring range		
Largest measuring range		

 ppm (vpm)

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Cannot be combined

Gas connections for sample gas and reference gas

Pipe with 6 mm outer diameter

0

0 → A21

Pipe with 1/4" outer diameter

1

1 → A20

Smallest possible span O<sub>2</sub>

0.5% reference gas pressure 3 000 hPa

A

0.5% reference gas pressure 100 hPa (external pump)

B

B B → A26, Y02

2% reference gas pressure 3 000 hPa

C

2% reference gas pressure 100 hPa (external pump)

D

D D → A26, Y02

5% reference gas pressure 3 000 hPa

E

5% reference gas pressure 100 hPa (external pump)

F

F F → A26, Y02

Sample chamber (OXYMAT channel)

Non-flow-type compensation branch

- Made of stainless steel, mat. no. 1.4571

- Made of tantalum

A

B

Flow-type compensation branch

- Made of stainless steel, mat. no. 1.4571

- Made of tantalum

C

D

C

D

Internal gas paths
Sample chamber<sup>1)</sup> (lining)  
(ULTRAMAT channel)
Reference chamber  
(flow-type)  
(ULTRAMAT channel)

(both channels)

Hose made of FKM

Aluminum

Non-flow-type

0

0 → A20, A21

(Viton)

Aluminum

Flow-type

1

Pipe made of titanium

Tantalum

Non-flow-type

4

4 → A20, A21, Y02

Tantalum

Flow-type

5

5 → Y02

Stainless steel pipe

Aluminum

Non-flow-type

6

6 → A20, A21

(mat. no. 1.4571)

Tantalum

Non-flow-type

8

8 → A20, A21

With sample gas monitoring (both channels)

Hose made of FKM

Aluminum

Non-flow-type

2

2 → A20, A21

(Viton)

Aluminum

Flow-type

3

Add-on electronics

Without

0

AUTOCAL function

- With 8 additional binary inputs and outputs for ULTRAMAT channel and OXYMAT channel

1

- With serial interface for the automotive industry (AK)

5

5 → Y02

- With 8 additional binary inputs/outputs and PROFIBUS PA interface for ULTRAMAT channel and OXYMAT channel

6

- With 8 additional binary inputs/outputs and PROFIBUS DP interface for ULTRAMAT channel and OXYMAT channel

7

Power supply

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

0

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

1

Footnote, see next page

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Combined measurement of IR-absorbing gas and O<sub>2</sub>

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Cannot be combined

<u>ULTRAMAT channel</u>		<u>Smallest measuring range</u>	<u>Largest measuring range</u>	
<u>Measured component</u>				
CO/NO	CO	0 ... 100 vpm	0 ... 1 000 vpm	A H
	NO	0 ... 300 vpm	0 ... 1 000 vpm	
CO/NO	CO	0 ... 300 vpm	0 ... 3 000 vpm	A J
	NO	0 ... 500 vpm	0 ... 3 000 vpm	
CO/NO	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, two components in series", Page 2/8)				
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 100 vpm	0 ... 1 000 vpm	B A
	CO	0 ... 100 vpm	0 ... 1 000 vpm	
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 300 vpm	0 ... 3 000 vpm	B B
	CO	0 ... 300 vpm	0 ... 3 000 vpm	
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 1 000 vpm	0 ... 10 000 vpm	B C
	CO	0 ... 1 000 vpm	0 ... 10 000 vpm	
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 3 000 vpm	0 ... 30 000 vpm	B D
	CO	0 ... 3 000 vpm	0 ... 30 000 vpm	
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 1 %	0 ... 10 %	B E
	CO	0 ... 1 %	0 ... 10 %	
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 3 %	0 ... 30 %	B F
	CO	0 ... 3 %	0 ... 30 %	
CO <sub>2</sub> /CO	CO <sub>2</sub>	0 ... 10 %	0 ... 100 %	B G
	CO	0 ... 10 %	0 ... 100 %	
CO <sub>2</sub> /CH <sub>4</sub>	CO <sub>2</sub>	0 ... 10 %	0 ... 100 %	C G
	CH <sub>4</sub>	0 ... 10 %	0 ... 100 %	
CO <sub>2</sub> /NO	CO <sub>2</sub>	0 ... 300 vpm	0 ... 3 000 vpm	D J
	NO	0 ... 500 vpm	0 ... 3 000 vpm	

Operating software and documentation

German	0
English	1
French	2
Spanish	3
Italian	4

1) Only for cell length 20 to 180 mm

## Selection and ordering data

### Additional versions

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

Flow-type reference cell with reduced flow, 6 mm (ULTRAMAT channel) <sup>1)</sup>	<b>A20</b>	Cannot be combined
Flow-type reference cell with reduced flow, ¼" (ULTRAMAT channel) <sup>1)</sup>	<b>A21</b>	
Reference gas monitoring (pressure switch ... 3 000 hPa), for OXYMAT channel only	<b>A26</b>	
Connection pipes (can only be combined with the appropriate gas connection diameter and internal gas path materials)		
• Titanium connection pipe, 6 mm, complete with screwed gland, for sample gas side	<b>A22</b>	
• Titanium connection pipe, ¼", complete with screwed gland, for sample gas side	<b>A24</b>	
• Stainless steel connection pipe (mat. no. 1.4571), 6 mm, complete with screwed gland, for sample gas side	<b>A27</b>	
• Stainless steel connection pipe (mat. no. 1.4571), ¼", complete with screwed gland, for sample gas side	<b>A29</b>	
Telescopic rails (2 units)	<b>A31</b>	
Set of Torx screwdrivers	<b>A32</b>	
Kalrez gaskets in sample gas path (O <sub>2</sub> side)	<b>B01</b>	
TAG labels (specific inscription based on customer information)	<b>B03</b>	
Kalrez gaskets in sample gas path (IR side)	<b>B04</b>	
FM/CSA certificate – Class I Div 2	<b>E20</b>	
Clean for O <sub>2</sub> service (specially cleaned gas path) (ULTRAMAT channel and OXYMAT channel)	<b>Y02</b>	
Measuring range data in plain text <sup>2)</sup> , if different from the standard setting	<b>Y11</b>	
Special setting (only in conjunction with an application no., e.g. extended measuring range, only ULTRAMAT channel)	<b>Y12</b>	
Extended special setting (only in conjunction with an application no., e.g. determination of interference influences, only ULTRAMAT channel)	<b>Y13</b>	
TÜV version acc. to 13th and 17th BImSchV (only ULTRAMAT channel)	<b>Y17</b>	→ <b>E20</b>

### Retrofitting sets

	Order No.	
RS 485/Ethernet converter	<b>A5E00852383</b>	Cannot be combined
RS 485/RS 232 converter	<b>C79451-Z1589-U1</b>	
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<sup>1)</sup> Cannot be combined with non-flow-type reference cell.

<sup>2)</sup> Standard setting: 

Smallest measuring range	}	in % or ppm (vpm)
25% of largest measuring range		
Largest measuring range		

**TÜV, single component (IR channel)**

Component	CO (TÜV)		SO <sub>2</sub> (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 ...	Smallest measuring range from 0 to ...	Largest measuring range from 0 to ...
C			75 mg/m <sup>3</sup>	1 500 mg/m <sup>3</sup>			
D	50 mg/m <sup>3</sup>	1 000 mg/m <sup>3</sup>	300 mg/m <sup>3</sup>	3 000 mg/m <sup>3</sup>			
E			500 mg/m <sup>3</sup>	5 000 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>	2 000 mg/m <sup>3</sup>	
F	300 mg/m <sup>3</sup>	3 000 mg/m <sup>3</sup>	1 000 mg/m <sup>3</sup>	10 000 mg/m <sup>3</sup>	300 mg/m <sup>3</sup>	3 000 mg/m <sup>3</sup>	
G	500 mg/m <sup>3</sup>	5 000 mg/m <sup>3</sup>			500 mg/m <sup>3</sup>	5 000 mg/m <sup>3</sup>	
H	1 000 mg/m <sup>3</sup>	10 000 mg/m <sup>3</sup>	3 000 mg/m <sup>3</sup>	30 000 mg/m <sup>3</sup>	1 000 mg/m <sup>3</sup>	10 000 mg/m <sup>3</sup>	
K	3 000 mg/m <sup>3</sup>	30 000 mg/m <sup>3</sup>	10 g/m <sup>3</sup>	100 g/m <sup>3</sup>	3 000 mg/m <sup>3</sup>	30 000 mg/m <sup>3</sup>	
P	10 g/m <sup>3</sup>	100 g/m <sup>3</sup>	30 g/m <sup>3</sup>	300 g/m <sup>3</sup>	10 g/m <sup>3</sup>	100 g/m <sup>3</sup>	
R	30 g/m <sup>3</sup>	300 g/m <sup>3</sup>	100 g/m <sup>3</sup>	1 000 g/m <sup>3</sup>	30 g/m <sup>3</sup>	300 g/m <sup>3</sup>	
V	100 g/m <sup>3</sup>	1 160 g/m <sup>3</sup>	300 g/m <sup>3</sup>	2 630 g/m <sup>3</sup>	100 g/m <sup>3</sup>	1 250 g/m <sup>3</sup>	

**Ordering example**

ULTRAMAT/OXYMAT 6, TÜV

IR channel

Component: CO

Measuring range: 0 to 50/1 000 mg/m<sup>3</sup>

with hoses, non-flow-type reference cell

without automatic adjustment (AUTOCAL)

230 V AC; German

**7MB2023-0EA00-1XD0-Z +Y17****TÜV, two components in series**

Component	CO (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 ...
AH	75 mg/m <sup>3</sup>	1 000 mg/m <sup>3</sup>	200 mg/m <sup>3</sup>	2 000 mg/m <sup>3</sup>	
AJ	300 mg/m <sup>3</sup>	3 000 mg/m <sup>3</sup>	500 mg/m <sup>3</sup>	3 000 mg/m <sup>3</sup>	
AC	1 000 mg/m <sup>3</sup>	10 000 mg/m <sup>3</sup>	1 000 mg/m <sup>3</sup>	10 000 mg/m <sup>3</sup>	

**Ordering example**

ULTRAMAT/OXYMAT 6, TÜV

IR channel

Components: CO/NO

Measuring range CO: 0 to 75/1 000 mg/m<sup>3</sup>, NO: 0 to 200/2 000 mg/m<sup>3</sup>

with hoses, non-flow-type reference cell

without automatic adjustment (AUTOCAL)

230 V AC; German

**7MB2024-0EA00-1AH0-Z +Y17**