Overview

The entire SIPROCESS GA700 device is configured in a modular fashion and consists of a basic unit and at least one – maximum two – analyzer modules. It can optionally be fitted with up to two interfaces modules (option modules).

Benefits

The basic unit provides:

- Transmission and evaluation of measurement results
- Display and transmission of device parameters
- Operation (parameterization, configuration)

In addition to the analyzer modules, the basic unit contains the interfaces for the peripherals.

Application

Application areas

Depending on the analyzer modules installed, the device is predominantly used in the following sectors:

- Chemical industry
- Petrochemicals
- Steel
- Cement
- Power generation
- Environmental protection

Design

19" rack unit

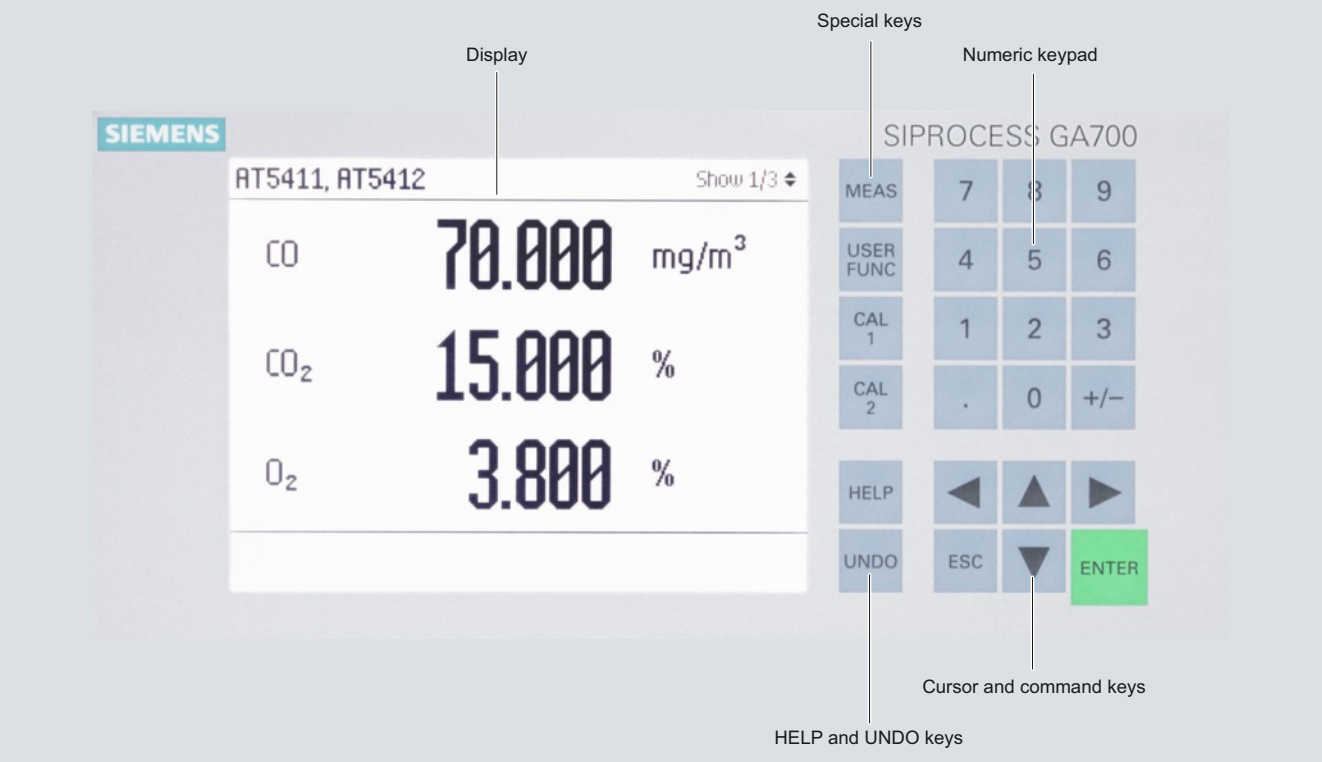
- 19" rack unit with 3 height units (HU) for installation
  - in hinged frames
  - in cabinets with or without telescopic rails
- Gas connections for sample gas inlet and outlet: for pipe diameter 6 mm or 1/4"
- Purging gas connections 10 mm and 3/8" (optional)

Wall-mounted device

- Gas connections for sample gas inlet and outlet: Pipe union for pipe diameter 6 mm or 1/4" (directly on the analyzer modules)
- Purging gas connections (optional), purging gas connection for 6 mm or 1/4" hose (optional)

Display and operator panel

- LCD panel for simultaneous display of:
  - Measured value
  - Status line
  - Measuring ranges
- Menu-driven operation for parameterization, test functions, adjustment
- Operator support in plain text
- Operating software (11 languages)



Display and operator panel of the SIPROCESS GA700 devices

Basic device

Inputs and outputs

- 8 digital inputs, designed for 24 V, potential-free, freely configurable (e.g. for measurement range switchover, processing of external signals from sample preparation)
- 8 relay outputs, with changeover contacts, freely configurable (e.g. for faults, maintenance requests, limit alarms, external solenoid valves)
- Ethernet connection contained in the basic unit (connection on the rear side, Ethernet RJ 45, 100 MBit)
- Service interface (front side); Ethernet RJ 45, 100 MBit.

Interface modules

- Option module 2.1:
  one analog output per measured component (max. 6, 0 to 20 mA, 4 to 20 mA or parameter assignment in accordance with NAMUR), plus 6 digital outputs

Function

Essential characteristics

- Measuring range identification
- Storage of measured values possible during adjustments
- Four freely parameterizable measuring ranges, also with suppressed zero point
- Autoranging possible; remote switching is also possible
- Wide range of selectable time constants (static/dynamic noise suppression); i.e. the response time of the analyzer can be matched to the respective measuring task
- Measuring point switchover for up to 12 measuring points (programmable)
- Parameterizable measuring point identification
- Automatic, parameterizable measuring range calibration
- Operation based on the NAMUR recommendation
- Three control levels with their own authorization codes for the prevention of accidental and unauthorized operator interventions
- Simple handling using a numerical membrane keyboard and operator prompting
- Customer-specific analyzer options such as:
  - Customer acceptance
  - TAG labels

Technical specifications

19" rack unit

General information	
Operating position	Horizontal
Conformity	CE mark in accordance with EN 50081-1 and EN 50082-2
Design, enclosure	
Weight without module	8.6 kg
Degree of protection	IP20 according to EN 60529
Electrical characteristics	
Power supply	100 to 240 V AC (nominal range of use 85 to 264 V), 50 to 60 Hz (nominal range of use 47 to 63 Hz)
Power consumption	280 VA max.
EMC interference immunity (electromagnetic compatibility)	In accordance with the standard requirements of NAMUR NE21 (05/2006) and EN 61326-1 (01/2008)
Electrical safety	In accordance with EN 61010-1, overvoltage category II
Electrical inputs and outputs	
Relay outputs	8, with changeover contacts, can be freely parameterized, e.g. for measuring range identification; max. load: 24 V AC/DC/40 W (total load for all 8 relay outputs in continuous operation max. 160 W), potential-free, non-sparking
Digital inputs	8, designed for 24 V, potential-free, can be freely parameterized, e.g. for measurement range switchover
Analog output	0/4 ... 20 mA, potential-free
Ethernet interface (rear)	Ethernet RJ 45, 100 MBit
Service interface (front)	Ethernet RJ 45, 100 MBit
Option module 2.1	6 analog outputs, 0/4 to 20 mA, potential-free; maximum load 750 Ω and 6 additional relay outputs, loading capacity: 24 V AC/DC/40 W, potential-free, non-sparking
Climatic conditions	
Permissible operating altitude	3 000 m above sea level
Permissible ambient temperature (with one module; application-dependent with two modules)	• -30 ... +70 °C during storage and transportation • 0 ... 50 °C during operation with one or two OXYMAT 7 analyzer modules Ventilation slits must not be covered (recommended minimum upward clearance from the next device when installing 2 analyzer modules and at maximum ambient temperature: min. 1 HU)
Permissible humidity	< 90 % RH (RH: relative humidity), during storage and transportation (dew point must not be undershot)

Wall housing

General information	
Operating position	Vertical
Conformity	CE mark in accordance with EN 50081-1 and EN 50082-2
Design, enclosure	
Weight without module	23 kg
Degree of protection	IP65 in accordance with EN 60529, restricted breathing enclosure to EN 50021
Electrical characteristics	
Power supply	100 to 240 V AC (nominal range of use 85 to 264 V), 50 to 60 Hz (nominal range of use 47 to 63 Hz)
Power consumption	280 VA max.
EMC interference immunity (electromagnetic compatibility)	In accordance with the standard requirements of NAMUR NE21 (05/2006) and EN 61326-1 (01/2008)
Electrical safety	In accordance with EN 61010-1, overvoltage category II
Gas inlet conditions	
Purging gas pressure	
• Permanent	< 100 hPa above atmospheric pressure
• For short periods	165 hPa above atmospheric pressure
Electrical inputs and outputs	
Relay outputs	8, with changeover contacts, can be freely parameterized, e.g. for measuring range identification; max. load: 24 V AC/DC/40 W (total load for all 8 relay outputs in continuous operation max. 160 W), potential-free, non-sparking
Digital inputs	8, designed for 24 V, potential-free, can be freely parameterized, e.g. for measurement range switchover
Analog output	0/4 ... 20 mA, potential-free
Ethernet interface (bottom)	Ethernet RJ 45, 100 MBit
Service interface (bottom)	Ethernet RJ 45, 100 MBit
Option module 2.1	6 analog outputs, 0/4 to 20 mA, potential-free; maximum load 750 Ω and 6 additional relay outputs, loading capacity: 24 V AC/DC/40 W, potential-free, non-sparking
Climatic conditions	
Permissible operating altitude	3 000 m above sea level
Permissible ambient temperature (with one module; application-dependent with two modules)	• -30 ... +65 °C during storage and transportation • 0 ... 50 °C during operation with one or two OXYMAT 7 analyzer modules
Permissible humidity	< 90 % RH (RH: relative humidity), during storage and transportation (dew point must not be undershot)

Basic device

Selection and ordering data	Order No.	
SIPROCESS GA700 [1]	**7MB3000-** ■■■■■- ■A■■	**Cannot be combined**
Basic unit versions		
Rack unit enclosure	0	0
Wall housing	3	
Module, installation position 1		
Without	X	X
OXYMAT 7	D	
Module, installation position 2		
Without	X	
OXYMAT 7	D	D
Gas management (only with AM, with hoses)		
No gas management, dummy plate without purging gas connection	0	
No gas management, dummy plate with purging gas connection (on request)		
Option module 1		
Without	0	
Option module 2		
Without	0	
Option module 2.1 (6 analog outputs and 6 digital outputs)	2	
Ex version		
Standard, set-up in non-hazardous zone	A	
Standard, set-up in non-hazardous zone with purging gas connection (wall structure)	B	B
Type		
Standard	0	

[1] Compact operating instructions 1 must always be selected when ordering.

Selection and ordering data	
Additional versions	**Order code**
Add "-**Z**" to Order No. and specify order code	
TAG labels (specific inscription based on customer information)	**B03**
Device name, ...(plain text)	**Y01**
Compact operating instructions 1 (must always be selected when ordering)	
• German	**L50**
• English	**L51**
• French	**L52**
• Italian	**L53**
• Spanish	**L54**
• Chinese (Simplified)	**L55**
• Portuguese (Brazilian)	**L56**
• Russian	**L57**
• Korean	**L58**
• Japanese	**L59**
Compact operating instructions 2 (selectable as option)	
• German	**L75**
• English	**L76**
• French	**L77**
• Italian	**L78**
• Spanish	**L79**
• Chinese (Simplified)	**L80**
• Portuguese (Brazilian)	**L81**
• Russian	**L82**
• Korean	**L83**
• Japanese	**L84**

Ordering examples

OXYMAT 7 module in rack unit enclosure "Example1"

7MB3000-0DX00-2AA0-Z + Y01 "Example1"

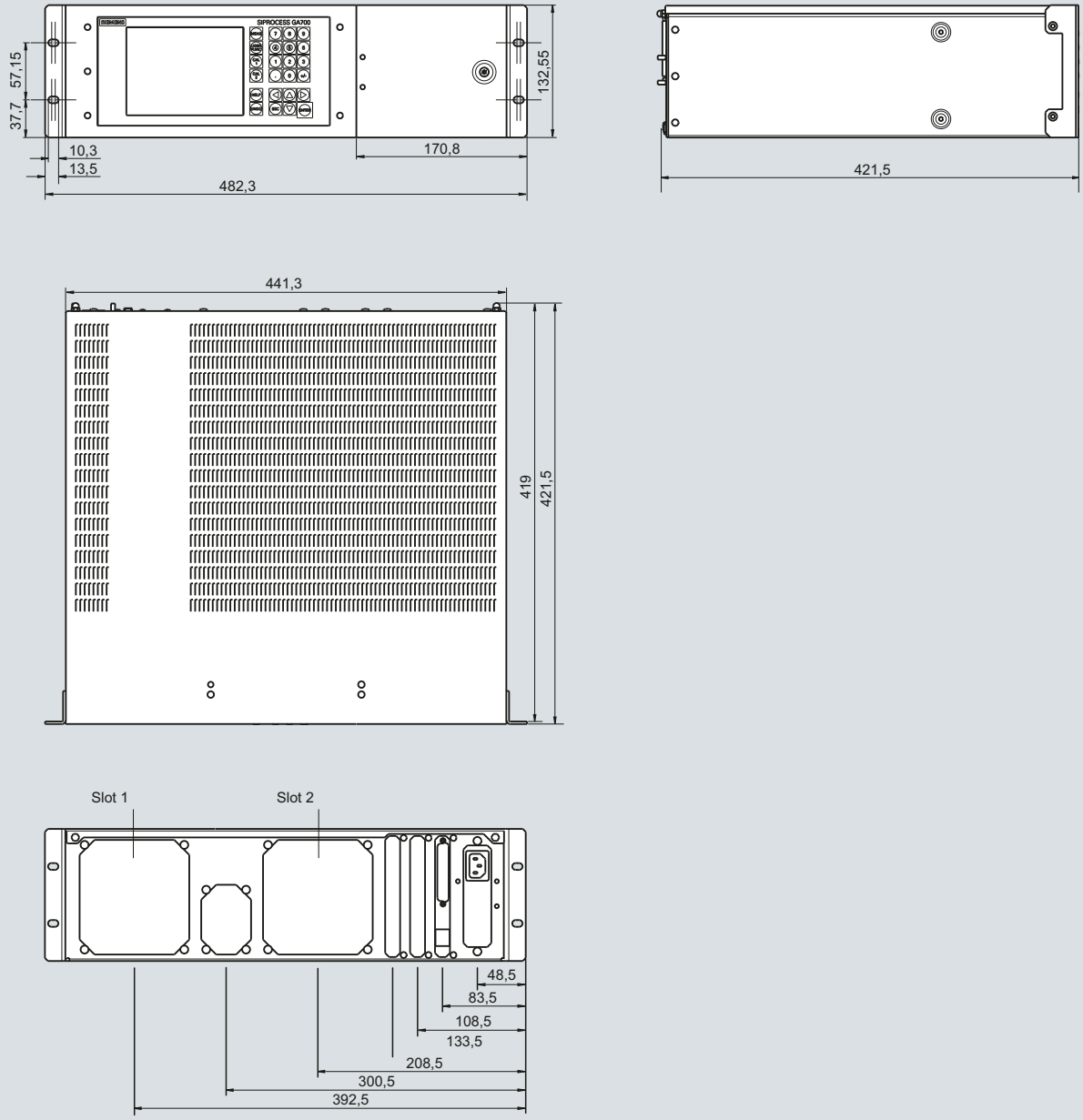
7MB3020-0AD00-0AA0-Z + Y01 "Example1"

OXYMAT 7 module in wall housing "Example2"

7MB3000-3DX00-2AA0-Z + Y01 "Example2"

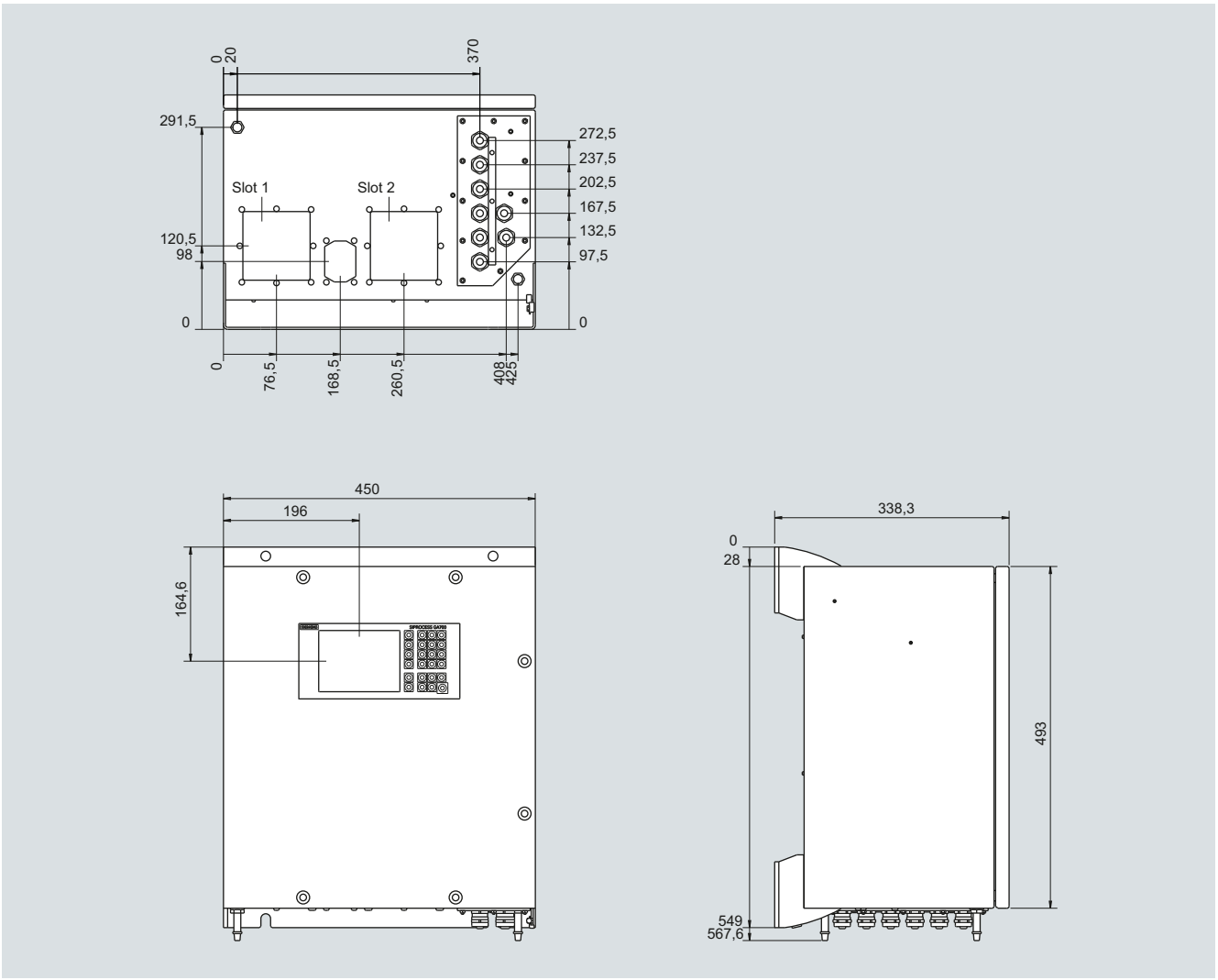
7MB3020-0AD00-0AA0-Z + Y01 "Example2"

Dimensional drawings



SIPROCESS GA700, rack unit, dimensions in mm

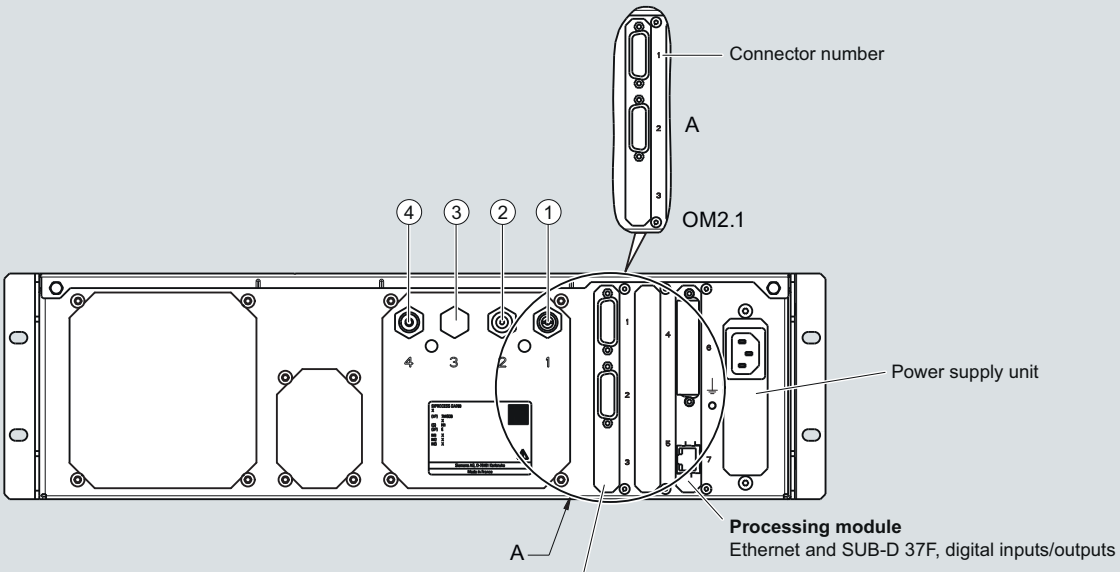
Basic device



SIPROCESS GA700, wall housing, dimensions in mm

Schematics

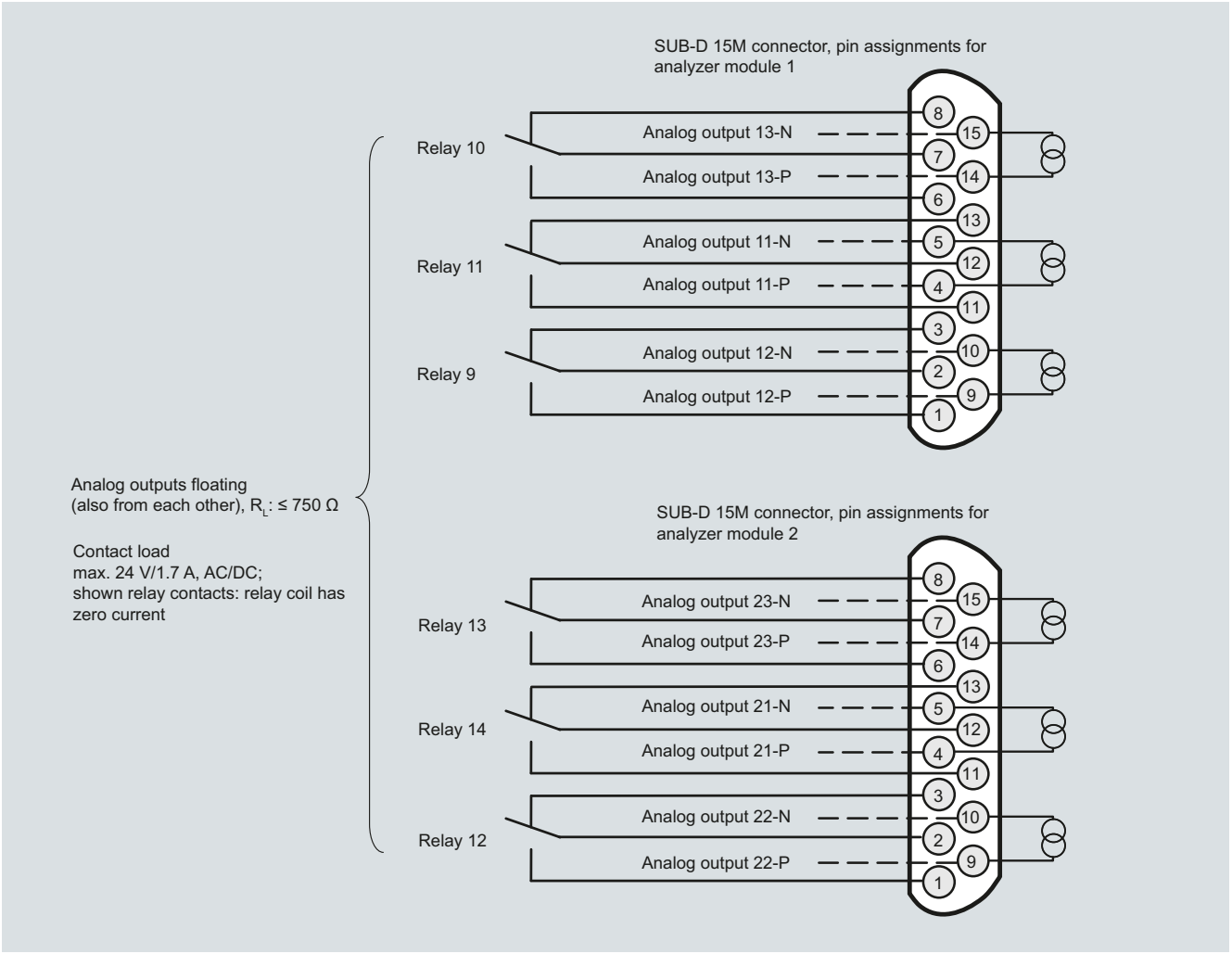
Connection of the signal cables



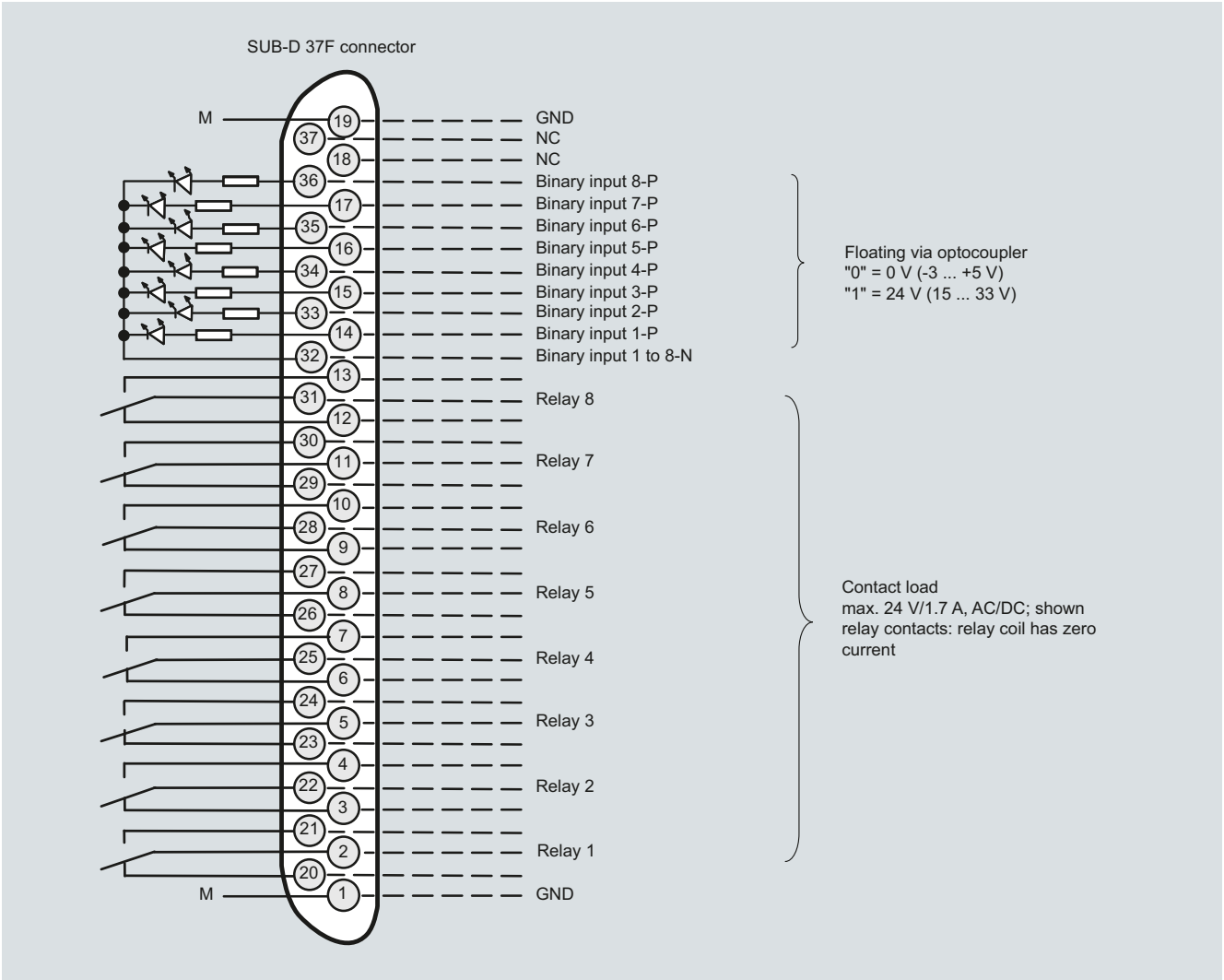
Expansion options for processing and option modules with the example of the rear wall of the rack unit

Basic device

Pin assignments (rack unit enclosure)



Pin assignments of option module 2.1

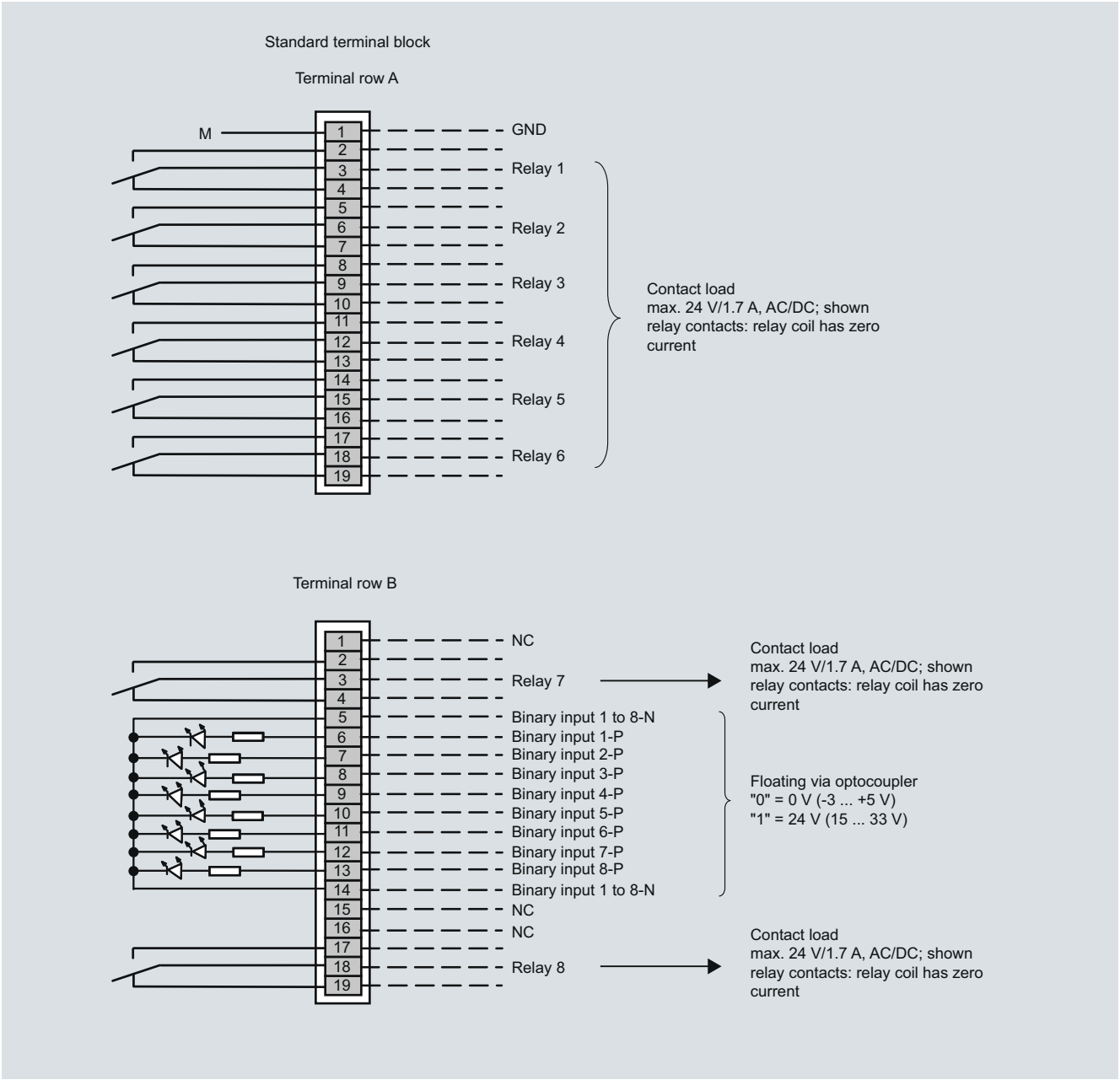


Pin assignment of the processing module (basic unit)

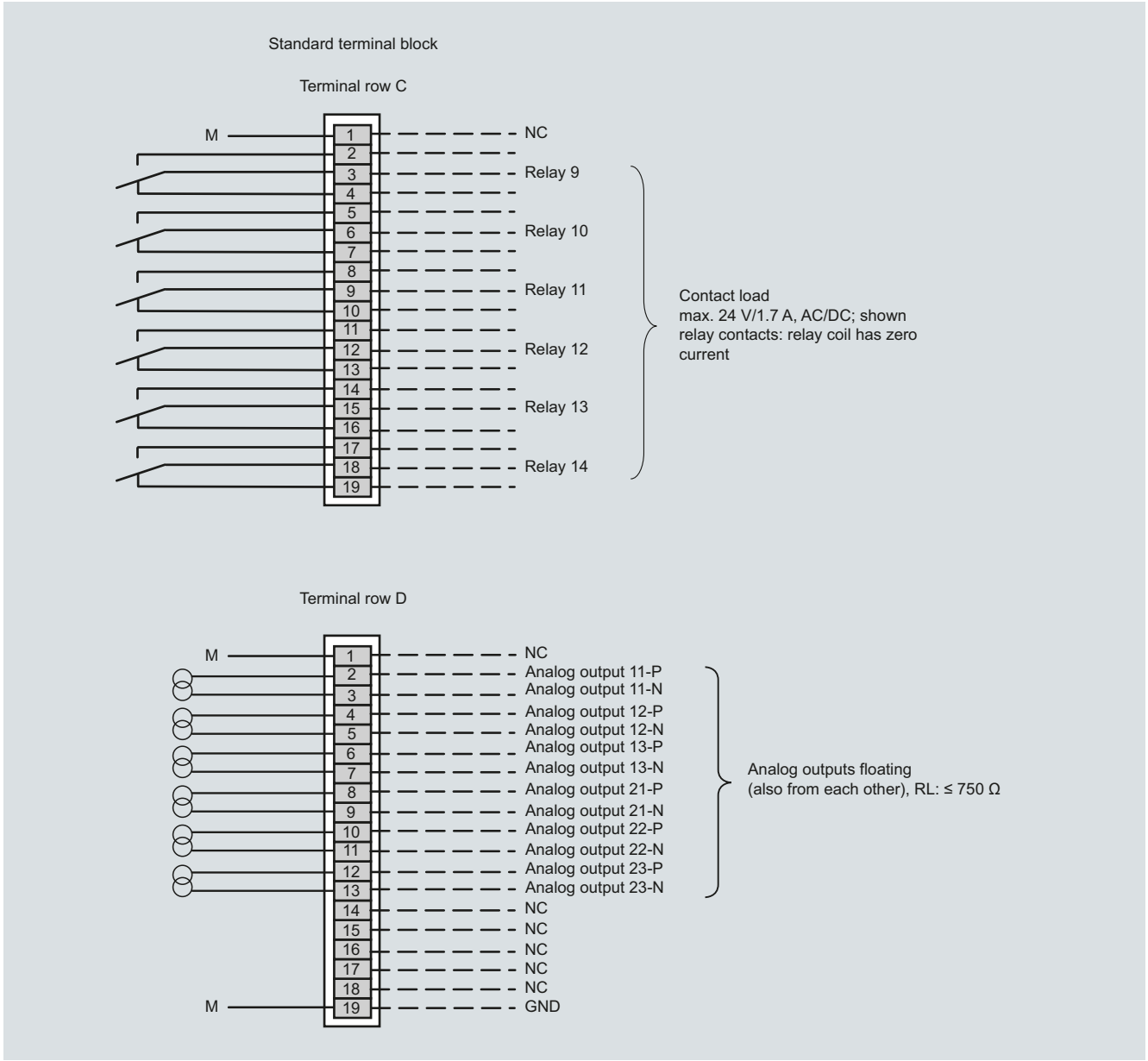
Basic device

1

Terminal assignment (wall housing)



Terminal assignment, standard terminal block, terminal rows A and B



Terminal assignment, standard terminal block, terminal rows C and D

Assignment between terminal block and analyzer module

Terminal row C

Relays 9 to 11 correspond to status display of analyzer module 1

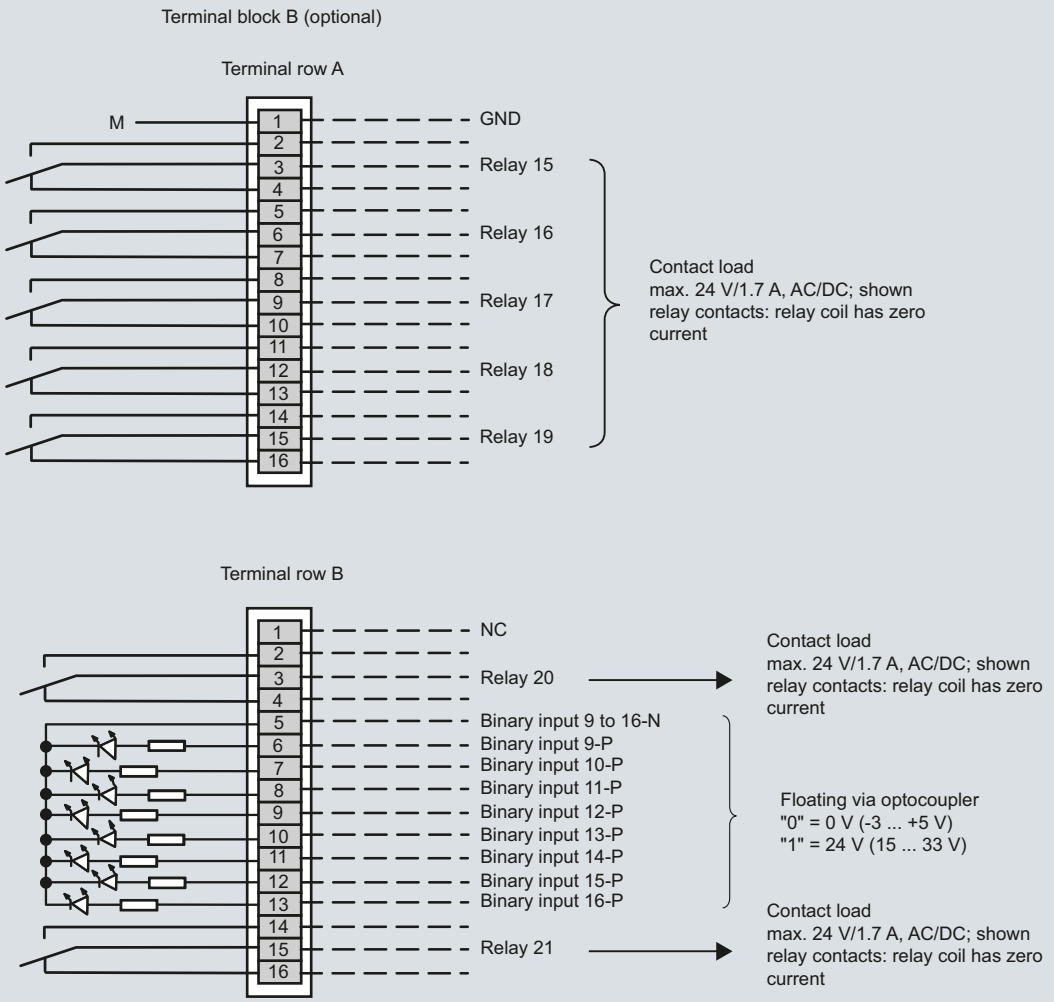
Relays 12 to 14 correspond to status display of analyzer module 2

Terminal row D

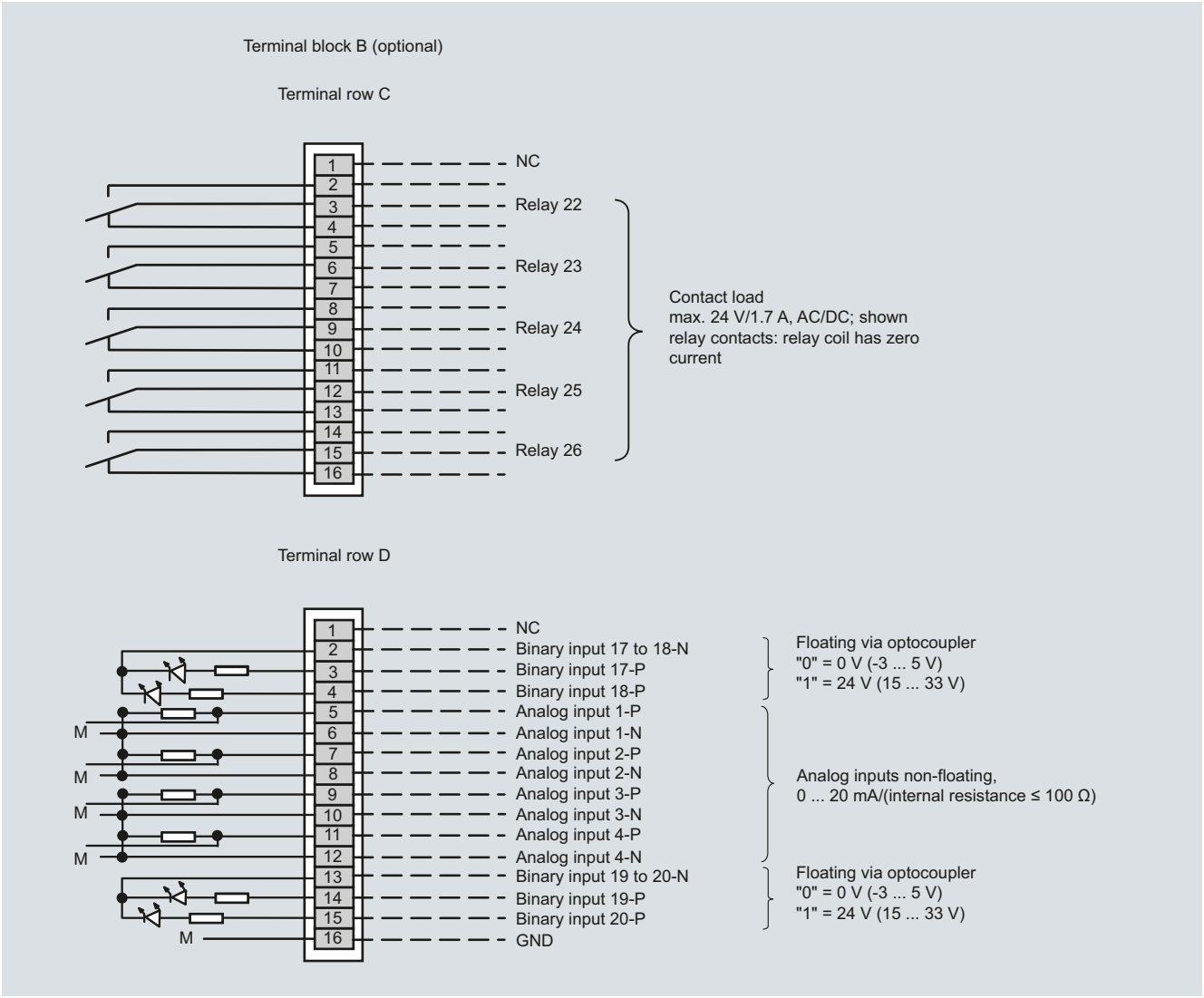
Analog outputs 11 to 13 correspond to analyzer module 1

Analog outputs 21 to 23 correspond to analyzer module 2

Basic device



Terminal assignment, terminal block B, terminal rows A and B



Terminal assignment, terminal block B, terminal rows C and D

1

Analyzer module OXYMAT 7

Overview

The function of the OXYMAT 7 analyzer module is based on the paramagnetic alternating pressure method and is used to measure oxygen in gases.

Benefits

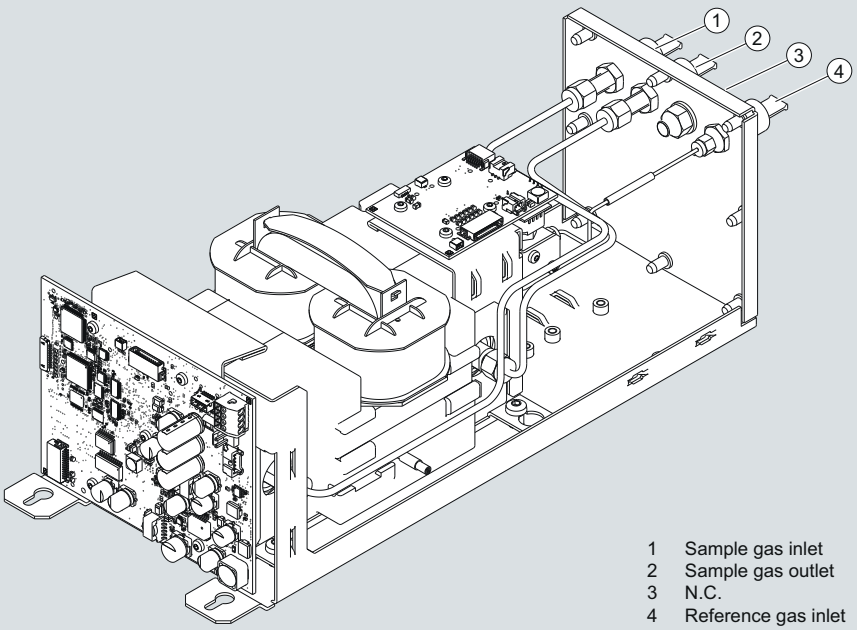
- Paramagnetic alternating pressure principle
  - Small measuring ranges (0 to 0.5 % or 99.5 to 100 % O_2)
  - Absolute linearity
- Detector element has no contact with the sample gas
  - Applicable in the absence of corrosive sample gases
  - Long service life
- Physically suppressed zero point possible, e.g. in the measuring range 98 % or 99.5 % to 100 % O_2

Application

Application areas

- For boiler control in incineration plants
- In chemical plants
- For ultra-pure gas quality monitoring
- In environmental protection
- For quality control
- Purity control/air separator

Design



1 Sample gas inlet
2 Sample gas outlet
3 N.C.
4 Reference gas inlet

Structure of high-pressure version, sample gas path with pipes

Designs – Parts wetted by sample gas, standard

Gas path		Material
With hoses	Bushing	PVDF
	Hose	FKM (e.g. Viton)
	Sample chamber	Stainless steel, mat. no. 1.4571
	O-rings/seals	FPM
	Restrictor	PTFE (e.g. Teflon)

Gas path		Material
With pipes	Bushing	Stainless steel, mat. no. 1.4571
	Pipe	Stainless steel, mat. no. 1.4571
	Sample chamber	Stainless steel, mat. no. 1.4571
	Sample gas restrictor	Stainless steel, mat. no. 1.4571
	O-rings/seals	FKM (Viton) or FFKM (Kalrez)
Special applications		Materials adapted to the application

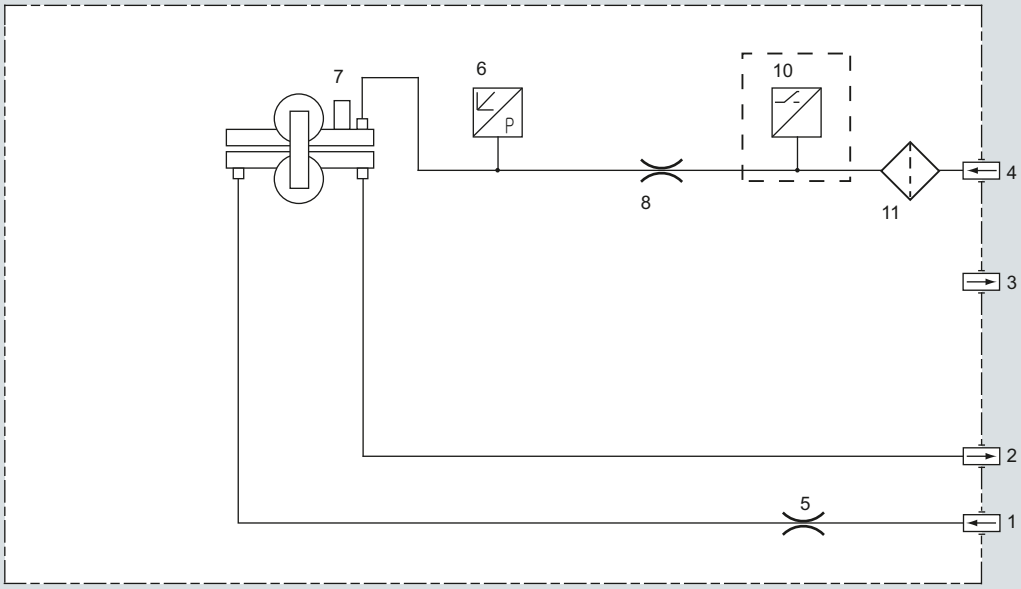
Options

Pressure switch	Diaphragm	FKM (Viton)
	Enclosure	PA 6.3 T

Gas path

High-pressure version with optional pressure switch for monitoring reference gas pressure

Reference gas pressure	2 000 … 4 000 hPa above sample gas pressure, but max. 5 000 hPa
Sample gas pressure	
• With hoses	Max. 1 500 hPa above atmospheric pressure
• With pipes	Max. 2 500 hPa above atmospheric pressure
Sample gas path	With hoses or with pipes



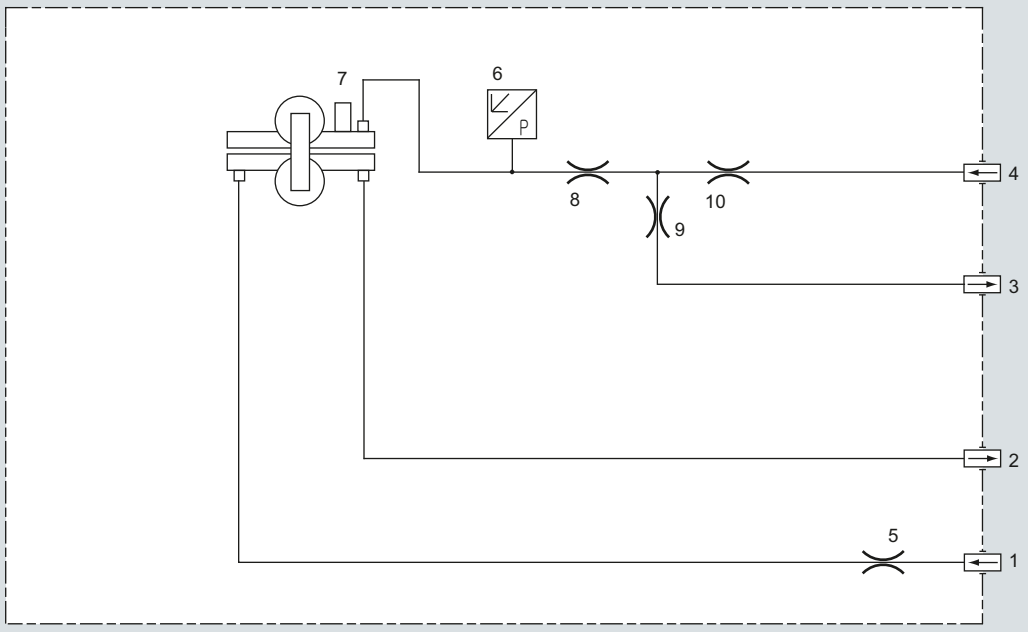
1 Sample gas inlet
2 Sample gas outlet
3 N. C.
4 Reference gas inlet
5 Sample gas restrictor
6 Pressure sensor p for sample gas pressure
7 Analyzer unit
8 Reference gas restrictor
10 Pressure switch for reference gas monitoring (optional)
11 Reference gas fine filter

Gas path plan, high-pressure version with optional pressure switch for monitoring reference gas pressure

Analyzer module OXYMAT 7

Low-pressure version with external reference gas pump

Reference gas pressure	100 hPa above the sample gas pressure (low-pressure version) for the connection of an external pump
Sample gas pressure	Atmospheric pressure ±50 hPa
Sample gas path	with hoses
Reference gas path	with hoses



1 Sample gas inlet
2 Sample gas outlet
3 Bypass outlet
4 Reference gas inlet, external pump, delivery pressure approx. 100 hPa
5 Sample gas restrictor
6 Pressure sensor p for sample gas pressure
7 Analysis part
8 Reference gas restrictor
9 Bypass restrictor
10 Damping restrictor

Gas path plan, low-pressure with external reference gas pump, with hoses

Mode of operation

Oxygen is highly paramagnetic. This outstanding property of paramagnetism is used as a physical measuring effect for oxygen analysis.

Oxygen molecules in an inhomogeneous magnetic field always move toward the higher field strength. This results in a higher oxygen concentration where the field strength is higher (higher oxygen partial pressure). If two gases with differing oxygen content are combined in a magnetic field, a (O_2 partial) pressure difference arises between them.

Since the measuring effect is always based on the difference of the oxygen content of the two gases, one refers to the sample and reference gases.

For measuring oxygen in the OXYMAT 7, the reference gas (N_2, O_2 or air) flows through two channels into the sample chamber (6). One of these partial flows enters the measuring chamber (7) in the area of the magnetic field. If the sample gas is O_2-free, the reference gas can flow out freely. If the sample gas does contain O_2, however, the oxygen molecules concentrate in the area of the magnetic field. The reference gas can then no longer flow off freely. An alternating pressure results between the two reference gas inlets. This pulsates in step with the magnetic field and depends on the oxygen concentration. This causes an alternating flow in the microflow sensor (4).

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 alternating flow results in a change in the resistance of the nickel-plated grids. The resulting offset in the bridge is a measure of the concentration of oxygen in the sample gas.

Because the microflow sensor is located in the reference gas flow, the measurement is not influenced by the thermal conductivity, the specific heat or the internal friction of the sample gas. Additionally, the microflow sensor is protected through this arrangement from corrosion caused by the sample gas.

Further information

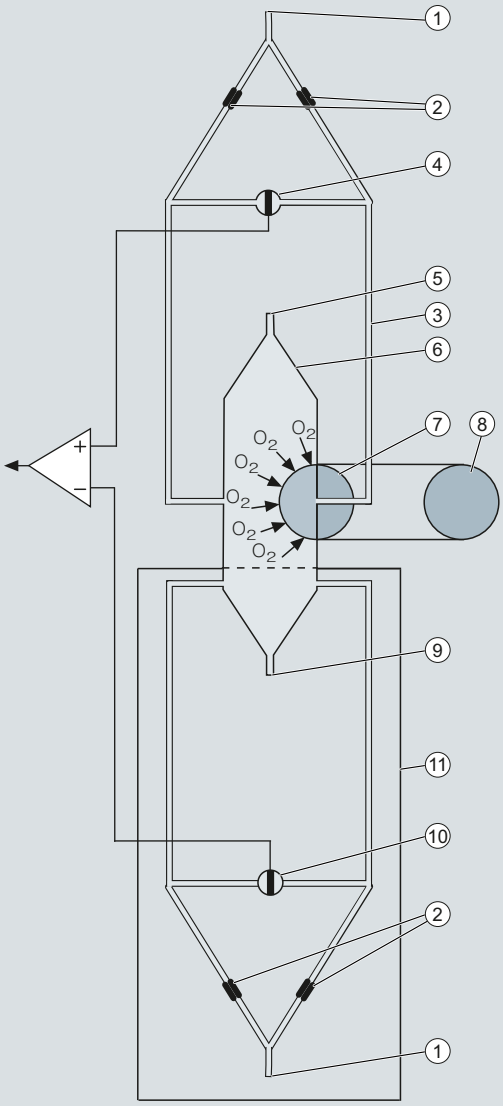
The oscillating magnetic field (8) means that the basic flow at the microflow sensor is not detected. The measurement is, thus, independent of the module's operating position or the position of the sample chamber.

The sample chamber is directly in the sample path and has a small volume, and the microflow sensor is a low-lag sensor. As a result, extremely short response times are realized.

Vibrations at the installation site can interfere with the measured signal (e.g. large fluctuations in the output signal). This behavior can be compensated for by a second (optional) microflow sensor (10), which functions as a vibration sensor. Since large differences in density between the sample and reference gases further amplify the undesired influence of vibration, reference gas is channeled to both the compensation microflow sensor (10) and the sample microflow sensor (4).

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.

Flowing reference gas prevents the microflow sensor from being damaged and maintains the measurement capability of the analysis module.



1 Reference gas inlet
2 Restrictors
3 Reference gas channels
4 Microflow sensor for measured signal
5 Sample gas inlet
6 Sample chamber
7 Source of the paramagnetic measuring effect
8 Electromagnet with alternating current strength
9 Sample gas and reference gas outlet
10 Microflow sensor in the vibration compensation system (order variant)
11 Compensation circuit (optional)

OXYMAT 7, principle of operation

Analyzer module OXYMAT 7

Essential characteristics

Technical features

Depending on the reference gas, the physical zero point can be set between 0 % and 100 % oxygen.

- Smallest measuring spans (up to 0.5 % O_2) possible
- Measuring ranges with physically suppressed zero points possible (e.g. 99.5 % to 100 %)
- Short response time
- Low long-term drift
- Also suitable for use with highly corrosive sample gases (material 1.4571 or Hastelloy C22)
- Monitoring of reference gas pressure with reference gas connection 3 000 to 5 000 hPa (abs.) (option)

Features

- Electrically isolated measured value output 0/4 to 20 mA (also inverted)
- Internal pressure sensor for correction of pressure variations in sample gas in the range from 500 to 2 500 hPa (absolute)
- External pressure sensor - only with piping as the gas path - can be connected for correction of variations in the sample gas pressure up to 3 000 hPa absolute (option)
- Monitoring of reference gas (option)
- Analysis part with flow-type compensation circuit as an order variant for reducing the vibration impact at the installation site
- For sample gas path with hoses: Connection cable to the pressure sensor with hoses
- Hardware adapted to application
- Customer-specific analyzer options such as:
  - Drift recording
  - Clean for O_2 service
  - Kalrez gaskets
- Sample chamber for use in presence of highly corrosive sample gases

Reference gases

Measuring range	Recommended reference gas	Reference gas connection pressure	Comments
0 to ... vol.% O_2	N_2	2 000 … 4 000 hPa above sample gas pressure (max. 5 000 hPa absolute)	The reference gas flow is set automatically to 5 … 10 ml/min (up to 20 ml/min with flow-type compensation branch)
... to 100 vol.% O_2 (suppressed zero with full-scale value 100 vol.% O_2)	O_2		
Around 21 vol.% O_2 (suppressed zero point with 21 vol.% O_2 within the measuring span)	Air	100 hPa with respect to sample gas pressure, which may vary by max. 50 hPa around the atmospheric pressure	

Table 1: Reference gases for OXYMAT 7

Correction of zero point error/cross-sensitivities

Accompanying gas (concentration 100 vol.%)	Zero point deviation in vol.% O_2 absolute
Organic gases	
Ethane C_2H_6	-0,49
Ethene (ethylene) C_2H_4	-0,22
Ethine (acetylene) C_2H_2	-0,29
1.2 butadiene C_4H_6	-0,65
1.3 butadiene C_4H_6	-0,49
n-butane C_4H_{10}	-1,26
iso-butane C_4H_{10}	-1,30
1-butene C_4H_8	-0,96
iso-butene C_4H_8	-1,06
Dichlorodifluoromethane (R12) CCl_2F_2	-1,32
Acetic acid CH_3COOH	-0,64
n-heptane C_7H_{16}	-2,40
n-hexane C_6H_{14}	-2,02
Cyclo-hexane C_6H_{12}	-1,84
Methane CH_4	-0,18
Methanol CH_3OH	-0,31
n-octane C_8H_{18}	-2,78
n-pentane C_5H_{12}	-1,68
iso-pentane C_5H_{12}	-1,49
Propane C_3H_8	-0,87
Propylene C_3H_6	-0,64
Trichlorofluoromethane (R11) CCl_3F	-1,63
Vinyl chloride C_2H_3Cl	-0,77
Vinyl fluoride C_2H_3F	-0,55
1.1 vinylidene chloride $C_2H_2Cl_2$	-1,22
Inert gases	
Helium He	+0,33
Neon Ne	+0,17
Argon Ar	-0,25
Krypton Kr	-0,55
Xenon Xe	-1,05
Inorganic gases	
Ammonia NH_3	-0,20
Hydrogen bromide HBr	-0,76
Chlorine Cl_2	-0,94
Hydrogen chloride HCl	-0,35
Dinitrogen monoxide N_2O	-0,23
Hydrogen fluoride HF	+0,10
Hydrogen iodide HI	-1,19
Carbon dioxide CO_2	-0,30
Carbon monoxide CO	+0,07
Nitrogen oxide NO	+42,94
Nitrogen N_2	0,00
Nitrogen dioxide NO_2	+20,00
Sulfur dioxide SO_2	-0,20
Sulfur hexafluoride SF_6	-1,05
Hydrogen sulfide H_2S	-0,44
Water H_2O	-0,03
Hydrogen H_2	+0,26

Table 2: Zero point error due to diamagnetism or paramagnetism of some carrier gases with nitrogen as the reference gas at 60°C and 1 000 hPa absolute (according to IEC 1207/3)

Conversion to other temperatures:

The deviations from the zero point listed in Table 2 must be multiplied by a correction factor (k):

- with diamagnetic gases: $k = 333\ K / (\varphi\ [°C] + 273\ K)$
- with paramagnetic gases: $k = [333\ K / (\varphi\ [°C] + 273\ K)]^2$

(All diamagnetic gases have a negative deviation from zero point).

Analyzer module OXYMAT 7

Technical specifications

The technical specifications are based on the definitions of DIN EN 61207-1.

Unless specified otherwise, the data listed below relates to the following measurement conditions:

Ambient temperature	25 °C
Atmospheric pressure	Atmospheric (approx. 1 000 hPa)
Sample gas flow	0.6 l/min (or Nl/min)
Reference gas	Nitrogen
Site of installation	Vibration- and impact-free
General information	
Weight	Approx. 5.5 kg (standard version)
Measuring ranges	
Number of measuring ranges	Max. 4; parameters can be assigned freely
Parameters can be assigned in the measuring ranges	
• Smallest possible measuring spans	0.5 % (≥ 1 % for high-temperature model), 2 % or 5 % O_2
• Largest possible measuring spans	100 % O_2
Gas inlet conditions	
Sample gas pressure	
• Devices with tubes	500 … 1 500 hPa (abs.)
• Devices with pipes	
- Without vibration compensation	500 to 3 000 hPa (abs.); short-term max. 5 000 hPa (abs.)
- With vibration compensation	500 to 2 500 hPa (abs.); short-term max. 5 000 hPa (abs.)
Correction of the internal pressure sensor	
• Devices with tubes	500 … 1 450 hPa (abs.)
• Devices with pipes	500 … 2 450 hPa (abs.)
Reference gas pressure	
• High-pressure connection	0.2 to 0.4 MPa above the sample gas pressure, but a maximum of 0.5 MPa (absolute)
- Without vibration compensation	2 000 … 3 500 hPa above sample gas pressure; max. 5 000 hPa (abs.)
- With vibration compensation	2 500 … 4 000 hPa above sample gas pressure; max. 5 000 hPa (abs.)
• Low-pressure connection with external reference gas pump (only for sample gas pressure 500 ... 1 500 hPa (absolute))	100 hPa above the sample gas pressure
Pressure loss between sample gas inlet and sample gas outlet	< 100 hPa at 1 l/min
Sample gas flow	18 … 60 l/h (0.3 … 1 l/min)
Sample gas temperature	0 … 60 °C
Sample gas humidity (rel. humidity)	< 90 % (condensation inside the gas path is to be avoided)
Sample chamber temperature	
Standard version	Approx. 72 °C

Time response	
Warm-up period at room temperature	< 2 h
Dead time (T10)	< 0.5 s
Signal rise time or fall time for a flow rate of 1 l/min, a static attenuation constant and a dynamic attenuation constant of 0 s	< 1 s
Time for device-internal signal processing	approx. 1 s
Delayed display T90	T90 < T10 + rise or fall time + signal processing time
Measuring response	
Output signal fluctuation	≤ 0.5 % of the current measuring span (6 σ value) for a static attenuation constant of 0 s and a dynamic attenuation setting of 5 % / 10 s (with activated vibration compensation: 1.5 times the value
Detection limit	≤ 1 % of smallest measuring span according to nameplate (with vibration compensation activated: 1.5 times the value)
Measured-value drift	≤ 0.5 %/month of current measuring span or ≤ 50 vpm oxygen, whichever is larger
Repeatability	≤ 0.5 % of current measuring span
Linearity error with ambient air as reference gas	≤ 0,1 %
Influencing variables	
Ambient temperature	
• At the zero point	≤ 0.5 % of smallest measuring span according to nameplate/10 K or ≤ 50 vpm O_2/10 K, whichever is larger
• At span	≤ 0.5 % of the current measuring span/10 K or ≤ 50 vpm O_2/10 K, whichever is larger
Sample gas pressure	
• Without pressure compensation	Deviation approx. 2 % of current measuring span/1 % pressure variation
• With pressure compensation switched on	≤ 0.2 % of the current measuring span/1 % pressure variation or ≤ 50 vpm O_2/1 % pressure variation, whichever is larger
Sample gas flow	≤ 1 % of the current measuring span with a flow rate change of 0.1 l/min within the permissible flow range (0.3 ... 1 l/min)
Carrier gases	Zero point deviation (cross-sensitivity) in accordance with Table A.1 of EN 61207-3
Supply voltage (fluctuations of the supply voltage of the basic unit*) in the range of 90 to 253 V AC/47 to 63 Hz)	≤ 0.1 % of full-scale value of characteristic

Electrical inputs and outputs	
Analog and digital interfaces	See basic unit
Gas connections	
With hoses	Plastic screw connection for plastic pipe or tube 4 mm/6 mm
With pipes	Connection for threaded joint; ISO female thread 1/8"
Climatic conditions	
Storage and transport	-30 … 70 °C
Permissible ambient temperature (for operation in basic unit)	0 … 50 °C
Relative humidity (RH) during storage, transport or operation	< 90 % (condensation from the installed components is to be avoided)
Materials of wetted parts	
Sample chamber	Stainless steel: • Plates: Mat. No. 1.4571 (X6CrNiMoTi 17-12-2) • Screw-in glands: Mat. No. 1.4404 (X2CrNiMo17-12-2) Hastelloy C22: • Plates: Mat. No. 2.4602 (NiCr21Mo14W) • Screw-in glands: Mat. No. 2.4819 (NiMo16Cr15W)
Gas path	
• With hoses	FPM (e.g. Viton), connections PVDF
• With pipes	Stainless steel: • Pipes: Mat. No. 1.4571 (X6CrNiMoTi 17-12-2) • Gas connections: Mat. No. 1.4404 (X2CrNiMo 17-12-2) Hastelloy C22: • Pipes: Mat. No. 2.4602 (NiCr21Mo14W) • Gas connections: Mat. No. 2.4819 (NiMo16Cr15W)
Sealing material	FPM (e.g. Viton) or FFKM Compound 2035 (e.g. Kalrez 2035 (see device certificate))
Special applications	
Gas path	
• With pipes	Materials adapted to the application

Analyzer module OXYMAT 7

1

Selection and ordering data			Order No.	Cannot be combined
Analyzer module OXYMAT 7			**7MB3020-** ■■■■ **0 -** ■ **AA0**	
For measurement of oxygen				
Integrated into basic unit[1]				
Rack unit			**0**	
Wall-mounted device			**1**	
Reference gas pressure				
Low-pressure version 100 hPa (for the connection of an external pump; without pressure switch)			**A**	**A A**
High pressure (3 000 ... 5 000 hPa) (absolute pressure values)			**C**	
High pressure (3 000 ... 5 000 hPa) (absolute pressure values), with pressure switch			**D**	
Smallest measuring range	Largest measuring range			
0 ... 0,5 %	0 ... 100 %		**B**	**B**
0 ... 1 %	0 ... 100 %		**C**	**C**
0 ... 2 %	0 ... 100 %		**D**	
0 ... 5 %	0 ... 100 %		**E**	
Gas path				
Material of gas path	Material of sample chamber	Temperature of analysis part		
Hose made of FKM (Viton)	Stainless steel (1.4571)	72 °C (thermostatted)	**0**	
Pipe made of stainless steel (1.4571)	Stainless steel (1.4571)	72 °C (thermostatted)	**2**	**2**
Vibration compensation				
Without			**0**	

[1] With order code "W01", please specify option "0".

Selection and ordering data	Order code
Additional versions	
Add "-**Z**" to Order No. and specify order code	
Delivery	
Supplied separately	**W01**
Integrated into the basic unit pos. no. ... (plain text); slot 1 (see dimensional drawing)	**Y01**
Integrated into the basic unit pos. no. ... (plain text); slot 2 (see dimensional drawing)	**Y02**
Settings	
Measuring range data in plain text, if different from the standard setting	**Y11**

Ordering examples

OXYMAT 7 module in rack unit enclosure "Example1"

7MB3000-0DX00-2AA0-Z + Y01 "Example1"

7MB3020-0AD00-0AA0-Z + Y01 "Example1"

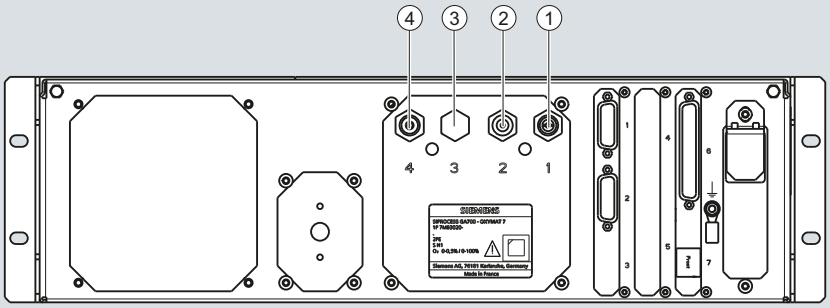
OXYMAT 7 module in wall housing "Example2"

7MB3000-3DX00-2AA0-Z + Y01 "Example2"

7MB3020-0AD00-0AA0-Z + Y01 "Example2"

Schematics

Gas connections



1 Sample gas inlet
2 Sample gas outlet
3 N.C., bypass outlet for version with internal and external reference gas pump
4 Reference gas inlet

Version with pipes

The gas connections are equipped with screw-in glands (ISO female thread 1/8"). This ensures that threaded joints can be used for pipes with a diameter of 1/4" and also with a diameter of 6 mm.

The external gas lines are screwed on to the sample gas inlet (1), sample gas outlet (2) and reference gas inlet.

Version with hoses

The gas connections consist of PVDF. Tubes made of FPM (e.g. Viton) or of PTFE (Teflon) with an inner diameter of 4 mm and wall thickness of 1 mm can be connected to the gas connections. The tubes are fastened with the screw cap of the PVDF screwed gland.

The reference gas connection is a screw connection as with the piped version (see above).