Overview

The CALOMAT 6 gas analyzer is primarily used for quantitative determination of H_2 or He in binary or quasi-binary non-corrosive gas mixtures.

Concentrations of other gases can also be measured if their thermal conductivities differ significantly from the residual gases like Ar, CO_2, CH_4, NH_3.

19" unit and field unit

Benefits

- Small T_{90} time due to micromechanical-produced Si sensor
- Universally usable hardware base, high measuring range dynamic (e.g. 0 ... 1%, 0 ... 100%, 95 ... 100% H_2)
- Integrated interfering gas correction, external calculation not required
- Open interface architecture (RS 485, RS 232, PROFIBUS)
- SIPROM GA network for maintenance and servicing information (option)
- Electronics and physics: gas-tight isolation, purging is possible, IP65, high service life even in harsh environments
- EEx(p) for zones 1 and 2 (according to 94/9/EC (ATEX 2G and ATEX 3G)), Class I Div 2 (CSA) Ex(n).

Application

- Pure gas monitoring (0 ... 1% H_2 in Ar)
- Inert gas monitoring (0 ... 2% He in N_2)
- Hydroargon gas monitoring (0 ... 25% H_2 in Ar)
- Forming gas control (0 ... 25% H_2 in N_2)
- Gas production:
  - 0 ... 2% He in N_2
  - 0 ... 10% Ar in O_2
- Chemical applications:
  - 0 ... 2% H_2 in NH_3
  - 50 ... 70% H_2 in N_2
- Wood gasification (0 ... 30% H_2 in $CO/CO_2/CH_4$)
- Blast furnace gas (0 ... 5% H_2 in $CO/CO_2/CH_4/N_2$)
- Bessemer converter gas (0 ... 20% H_2 in CO/CO_2)
- Monitoring equipment for hydrogen-cooled turbo-alternators:
  - 0 ... 100% CO_2/Ar in air
  - 0 ... 100% H_2 in CO_2/Ar
  - 80 ... 100% H_2 in air
- Version to analyze flammable and non-flammable gases or vapors for use in hazardous areas (zone 1 and zone 2).

Special applications

Besides the standard combinations, special applications are available on request (e.g. higher sample gas pressure up to 2000 hPa absolute).

Design

19" unit

- With 4 HU for installation
  - in hinged frames
  - in cabinets, with or without slide rails
- Front panel for service can be hinged down (for laptop connection)
- Internal gas paths: pipe made of stainless steel (type No. 1.4571)
- Gas connections for sample gas input and output and for reference gas: stubs, pipe diameter 6 mm or 1/4".

Field unit

- Two-door housing (IP65) with gas-tight separation of analyzer and electronics section
- Sections can be purged separately
- Gas path and stubs made of stainless steel (type No. 1.4571)
- Purging gas connections: pipe diameter 10 mm or 3/8"
- Gas connections for sample gas input and output and for reference gas: clamping ring connection for pipe diameter 6 mm or ¼".

Display and control panel

- Large LCD panel for simultaneous display of:
  - Measured value (digital and analog displays)
  - Status line
  - Measuring ranges
- Contrast of LCD panel adjustable using menu
- Permanent LED backlighting
- Washable membrane keyboard with five softkeys
- Menu-based operation for configuration, test functions and calibration
- User help in plain text
- Graphic display of concentration trend; programmable time intervals
- Operating software in two languages: German/English, English/Spanish, French/English, Spanish/English, Italian/English.

Inputs and outputs

- One analog output
- Two analog inputs programmable (e.g. for correction of cross interferences or external pressure sensor)
- Six binary inputs freely configurable (e.g. for range switching, processing external signals from sample conditioning)
- Six relay outputs freely configurable (e.g. for failure, maintenance request, limit alarm, external solenoid valves)
- Extension with eight additional binary inputs and eight additional relay outputs (e.g. for automatic calibration with up to four calibration gases).

Communication

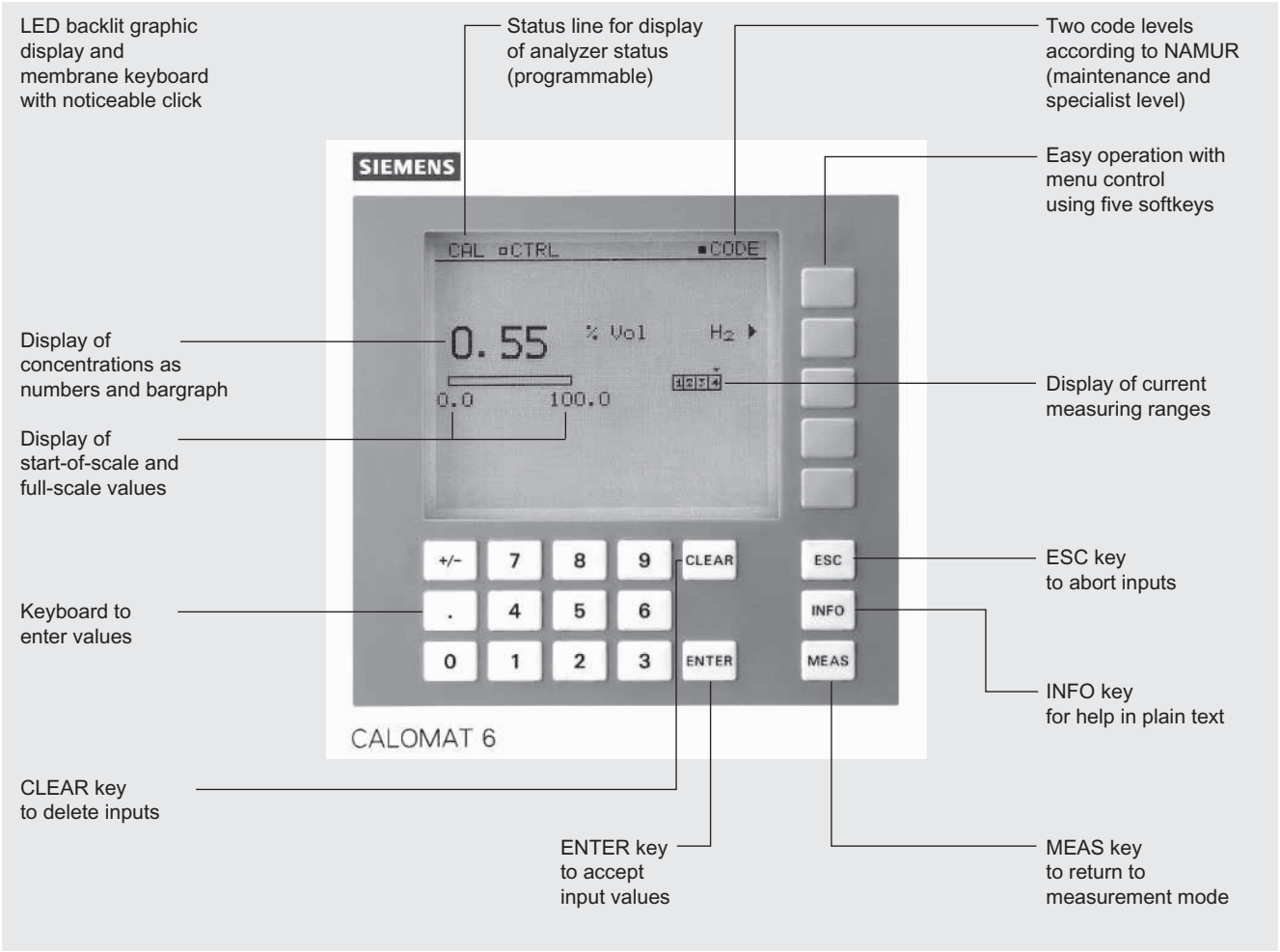
- RS 485 present in basic unit (connection at the rear, with 19" unit also possibility of connection behind the front plate).

Options

- RS 485/RS 232 converter
- TCP/IP Ethernet converter
- Linking to networks via PROFIBUS DP/PA interface
- SIPROM GA software as service and maintenance tool.

CALOMAT 6

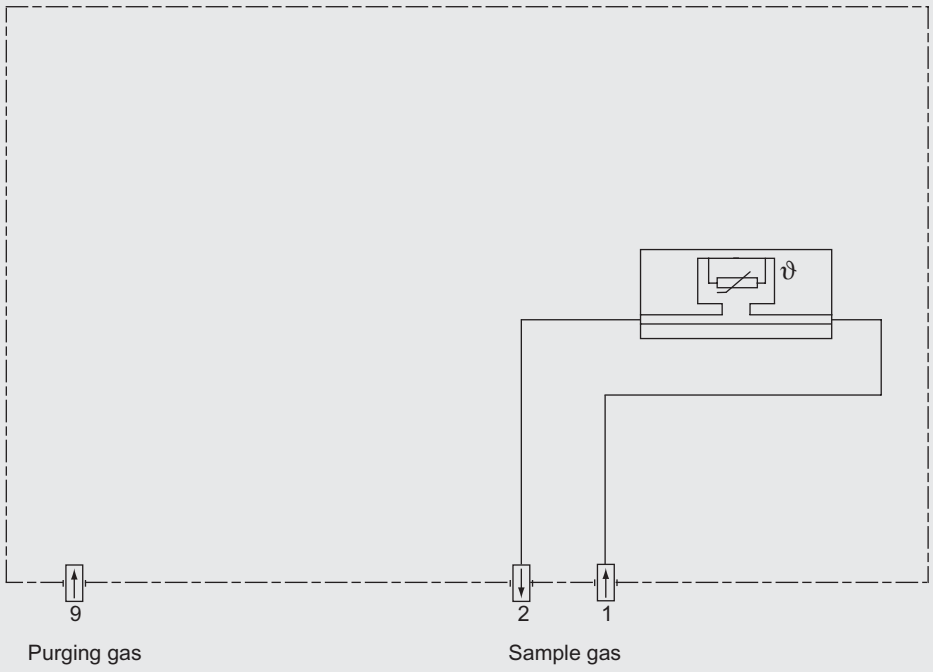
General



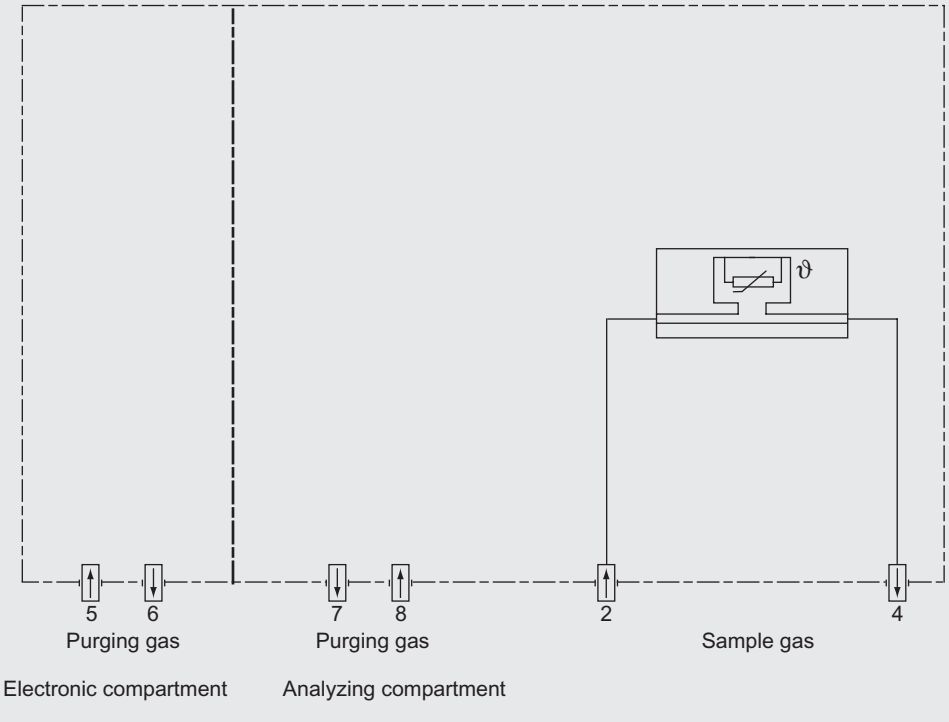
CALOMAT 6, membrane keyboard and graphic display

Versions – Wetted parts

Gas path		19“ unit	Field unit	Field unit Ex
With pipes	Bushing	SS, type No. 1.4571		
	Pipe	SS, type No. 1.4571		
	Sample cell body	SS, type No. 1.4571		
	O-rings	FFKM - Chemraz		
	Sensor	Si, SiO_xN_y, AU, epoxy resin, glass		
	Tightness	leakage < 1 µl/s		



CALOMAT 6, 19“ unit, gas path



CALOMAT 6, field unit, gas path

General

2

Function

Mode of operation

The measuring principle is based on the different thermal conductivity of gases.

The CALOMAT 6 sensor is a micromechanical-made Si chip with a measuring membrane and thin-film resistors.

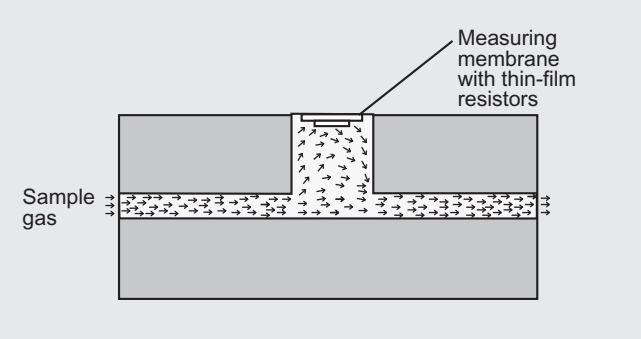
The resistors are adjusted on a constant temperature. This requires an current intensity depending on the sample gas thermal conductivity. Further this „coarse value" is electronically processed and used to calculate the gas concentration.

The sensor is located in a thermostatically-controlled stainless steel enclosure in order to prevent influences of ambient temperature changes.

To prevent the influences by the sample gas flow changes, the sensor is not placed in the main flow.

Note

The sample gas needs to be free of dust. Condensate (dew point of sample gas < ambient temperature) in the cells must be avoided. That is why the most measuring tasks require an appropriate gas preparation.



CALOMAT 6, mode of operation

Essential characteristics

- Four freely-progammable measuring ranges, also with zero offset, all measuring ranges linear
- Smallest spans up to 1% H_2 (with suppressed zero: 95 to 100% H_2) possible
- Measuring range identification
- Electrically isolated analog output 0/2/4 to 20 mA (also inverted)
- Autoranging or manual range switching possible; remote switching is also possible
- Storage of measured values possible during calibration
- Time constants selectable within wide limits (static/dynamic noise suppression); i.e. the response time of the analyzer can be matched to the respective application
- Short response time
- Low long-term drift
- Measuring point selection for up to 6 measuring points (can be parameterized)
- Measuring point identification
- External pressure sensor for correction of pressure variations in sample gas
- Automatic range calibration can be parameterized
- Operation based on NAMUR recommendation
- Two operation levels with separate access code to prevent unintentional and unauthorized inputs
- Simple handling using a numerical membrane keypad including operator prompting
- Customer-specific analyzer options such as e.g.:
  - Customer acceptance
  - Tag labels
  - Drift recording
  - Clean for O_2-Service.

Spans

The smallest and largest spans which are possible depend on the measured component (type of gas) as well as the respective application.

The smallest possible spans listed below refer to N_2 as the residual gas. With other gases which have a larger/smaller thermal conductivity than N_2, the smallest possible span is also larger/smaller.

Component	Smallest possible span
H_2	0 ... 1% (95 ... 100%)
He	0 ... 2%
Ar	0 ... 10%
CO_2	0 ... 20%
CH_4	0 ... 15%
H_2 in blast furnace gas	0 ... 10%
H_2 in converter gas	0 ... 20%
H_2 with wood gasification	0 ... 30%

Influence of interfering gases

Knowledge of the sample gas composition is necessary to determine the influence of residual gases with several interfering components.

The following table lists the zero offsets expressed in % H_2 resulting from 10% residual gas (interfering gas) in each case.

Component	Zero offset
Ar	-1.28%
CH_4	+1.59%
C_2H_6 (non-linear response)	-0.04%
C_3H_8	-0.80%
CO	-0.11%
CO_2	-1.07%
He	+6.51%
H_2O (non-linear response)	+1.58%
NH_3 (non-linear response)	+1.3%
O_2	-0.18%
SF_6	-2.47%
SO_2	-1.34%
Air (dry)	+0.5%

For residual gas concentrations differing from 10%, the correspondant multiple of the table value gives an acceptable approximation. This is valid for for residual gas concentrations up to 25% (dependent on gas type).

The thermal conductivity of most gas mixtures has a non-linear response. Even ambiguous results, such as e.g. with NH_3/N_2 mixtures, can occur within a specific concentration range.

In addition to a zero offset, it should also be noted that the gradient of the characteristic is influenced by the residual gas. However, this effect is negligible for most gases.

In case of correction of the influence of interfering gases with additional analyzers (ULTRAMAT 6/ULTRAMAT 23), the resulting measuring error can – depending on the application – amount up to 5% of the smallest measuring range of the application.

Example interfering gas correction

Specification of the interface cable

Characteristic impedance	100 ... 300 Ω, with a measuring frequency of > 100 kHz
Cable capacity	typ. < 60 pF/m
Wire section	> 0.22 mm^2, corresp. AWG 23
Cable type	twisted pairs, 1 x 2 wire of cable section
Signal attenuation	max. 9 dB over the whole length
Screening	copper braid shield or braid shield and foil screen
Connection	pin 3 and pin 8

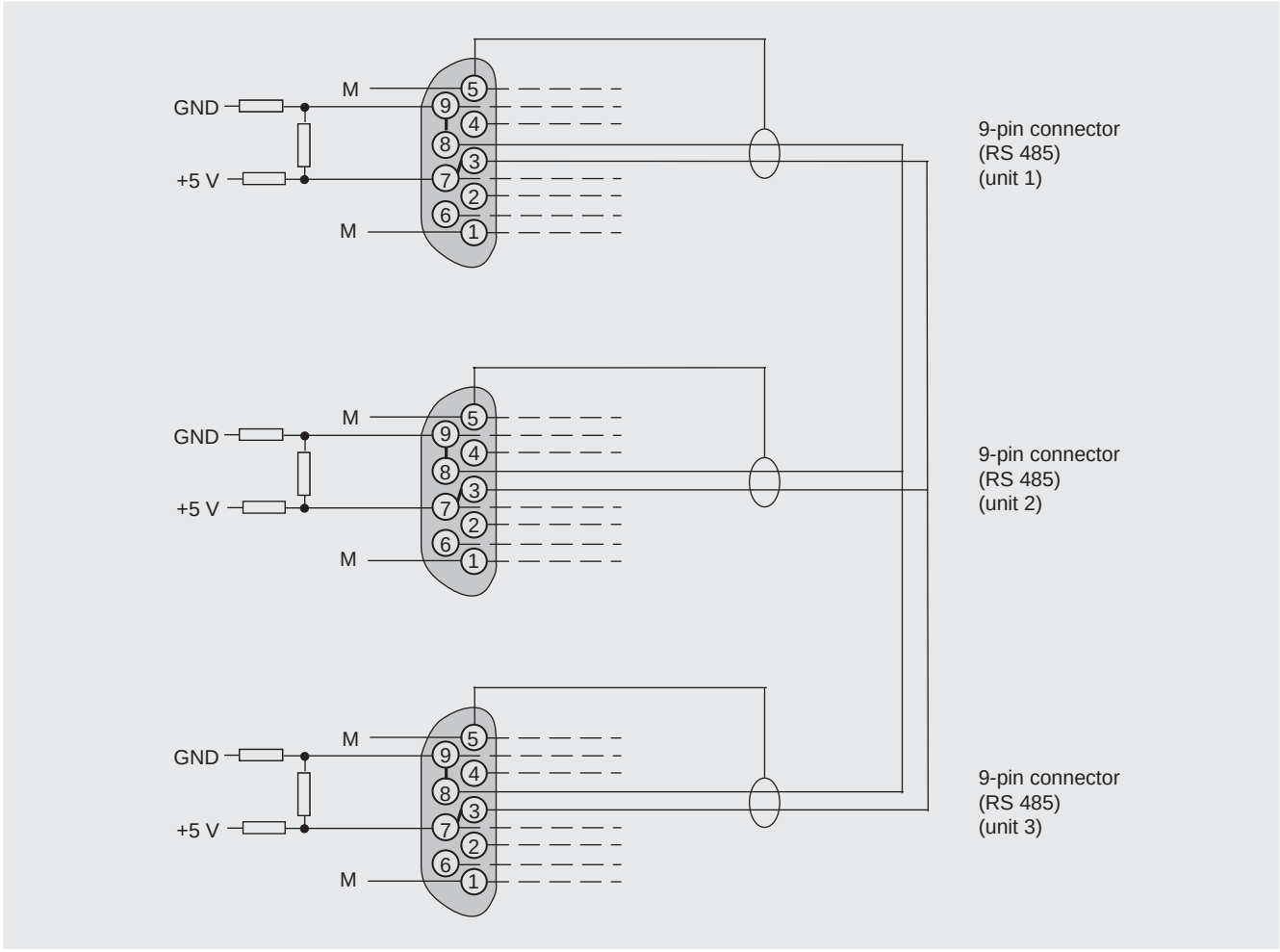
Bus terminating resistors

The pin 3-7 and 8-9 of the first and last connector of a bus cable have to be bridged (see figure).

Note

It is advisable to install a repeater on the device side in case of a cable length increasing 500 m or of high interferences.

Up to four components can be corrected via ELAN bus, a cross correction can be effected for up to two components via analog inlet.



Bus cable with connector assignments, example

CALOMAT 6

19" unit

Technical specifications

General (following DIN EN 61207 / IEC 1207. All data referred to binary gas mixture H_2 in N_2)

Measuring ranges	4, switchable internally and externally; autoranging is also possible
Largest possible measuring span	100% H_2 (smallest span see „Function“)
Measuring ranges with suppressed zero	Any zero point within 0 ... 100% can be achieved; smallest possible measuring span 5% H_2
Position of use	Front panel vertical
Conformity	CE identification EN 61326/A1, EN 61010/1

Design, enclosure

Degree of protection	IP20 according to EN 60529
Weight	Approx. 10 kg

Electrical characteristics

EMC interference immunity (**E**lectro**M**agnetic **C**ompatibility) (all signal wires must be shielded; variations of up to 4% of the smallest range may appear in ranges with strong electromagnetic interferences)	According to standard requirements of NAMUR NE21 (08/98)
Electrical safety	According to EN 61010-1; overvoltage category II
Power supply (see rating plate)	100 -10 % ... 120 V AC +10 %, 48 ... 63 Hz or 200 -10 % ... 240 V AC +10 %, 48 ... 63 Hz
Power consumption	Approx. 20 VA
Fuse links	100 ... 120 V: 1.0T/250 200 ... 240 V: 0.63T/250

Gas inlet conditions

Sample gas pressure	800 … 1100 hPa (absolute)
Sample gas flow	30 … 90 l/h (0.5 … 1.5 l/min)
Sample gas temperature	0 … 50 °C
Sample cell temperature	Approx. 60 °C
Sample gas humidity	< 90% relative humidity

Time response

Warm-up period	< 30 min (maximum accuracy achieved after 2 hours)
Response time (T_{90})	< 5 s
Damping (electric time constant)	0 … 100 s, programmable
Dead time (purging time of gas path in analyzer at 1 l/min)	Approx. 0.5 s

Measuring response (referred to 1000 hPa absolute sample gas pressure, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Output signal fluctuation	< ± 0.75% of smallest possible measuring range specified on rating plate with an electronic time constant of 1 s (σ = 0.25%)
Zero drift	< 1%/week of smallest possible measuring span specified on rating plate
Measured-value drift	< 0.5% of smallest possible-measuring span specified on rating plate
Repeatability	< 1% of respective measuring span
Minimum detection limit	1% of current measuring range
Linearity error	< ± 1% of respective measuring span

Influencing variables (referred to 1000 hPa absolute sample gas pressure, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Ambient temperature	< 1%/10 K referred to the smallest possible measuring span according to rating plate
Residual gases	Deviation in zero point (interfering gas influence see “Function“)
Sample gas flow	< 0.1% of smallest possible measuring span according to rating plate with a change in flow of 0.1 l/h within the permissible flow range
Sample gas pressure	< 1% for a pressure variation of 100 hPa
Power supply	< 0.1% of output signal span with rated voltage ± 10%

Electric inputs and outputs

Analog output	0/2/4 … 20 mA, floating; max. load 750 Ω
Relay outputs	6, with changeover contacts, freely selectable, e.g. for range identification; loading capacity: 24 V AC/DC/ 1 A, floating
Analog inputs	2, designed for 0/2/4 … 20 mA, for external pressure sensor and correction of influence of residual gas
Binary inputs	6, designed for 24 V, floating, freely-selectable, e.g. for range switching
Serial interface	RS 485
Options	Autocal function with 8 binary inputs and 8 relay outputs; also with PROFIBUS PA or PROFIBUS DP

Ambient conditions

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

Selection and Ordering Data

Order No. 7MB2521-□□□0□-□A□□ — cannot be combined

CALOMAT 6 gas analyzer 19“ unit for installation in cabinets		
Gas connections for sample gas Piping with outer diameter 6 mm Piping with outer diameter 1/4“		0 1
Measured component	**Smallest meas. range**	
H_2 in N_2	0-1/100%	AA
H_2 in N_2 (blast furnace gas meas.)[1]	0-1/100%	AW
H_2 in N_2 (converter gas meas.)[1]	0-1/100%	AX
H_2 in N_2 (wood gasification)[1]	0-1/100%	AY
H_2 in Ar	0-1/100%	AB
H_2 in NH_3	0-1/100%	AC
He in N_2	0-2/100%	BA
He in Ar	0-2/100%	BB
He in H_2	0-10/80%	BC
Ar in N_2	0-10/100%	CA
Ar in O_2	0-10/100%	CB
CO_2 in N_2	0-20/100%	DA
CH_4 in Ar	0-15/100%	EA
NH_3 in N_2	0-10/30%	FA
H_2 monitoring (turbo-alternators)		GA
CO_2 in air	0-100%	
H_2 in CO_2	0-100%	
H_2 in air	80-100%	
Supplementary electronics		
Without		0
Autocal function		
• With additional 8 binary inputs/outputs		1
• With additional 8 binary inputs/outputs and PROFIBUS PA interface		6
• With additional 8 binary inputs/outputs and PROFIBUS DP interface		7
Power supply		
100 V ... 120 V AC, 47 ... 63 Hz		0
200 V ... 240 V AC, 47 ... 63 Hz		1
Explosion protection		
Without		A
Certificate: ATEX II 3G, flammable and non-flammable gases		B → A11
Certificate CSA - Class I Div 2		D → A11
Language (documentation, software)		
German		0
English		1
French		2
Spanish		3
Italian		4

1) Prepared to supply external interfering gas corrections for CO, CO_2 and CH_4 (CH_4 only for blast furnace and converter gas measurement).

19" unit

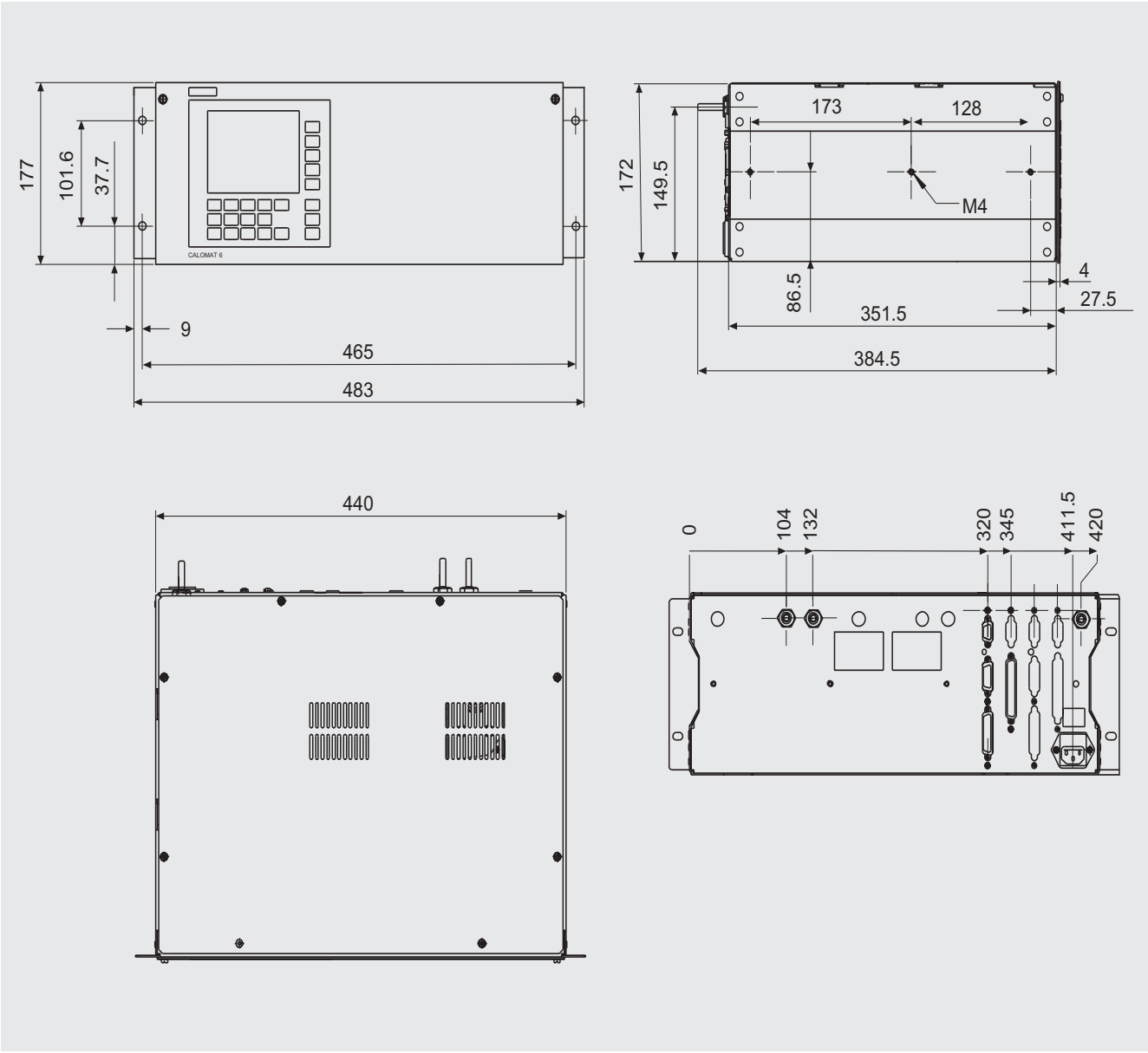
Selection and Ordering Data

Further versions Please add „-Z“ to Order No. and specify Order code.	Order code
Interface converter from RS 485 to RS 232	**A11**
Slide rails (2 rails)	**A31**
Set of Torx tools, socket spanner	**A32**
TAG labels (customer-defined inscriptions)	**B03**
Clean for O_2-Service (specially cleaned gas path)	**Y02**
Measuring range in plain text if different from standard setting	**Y11**

Retrofitting sets	Order No.
RS 485/Ethernet converter	**C79451-A3364-D61**
RS 485/RS 232 converter	**C79451-Z1589-U1**
Autocal function with 8 binary inputs/outputs	**C79451-A3480-D511**
Autocal function with 8 binary inputs/outputs and PROFIBUS PA	**A5E00057307**
Autocal function with 8 binary inputs/outputs and PROFIBUS DP	**A5E00057312**

2

Dimensional drawings

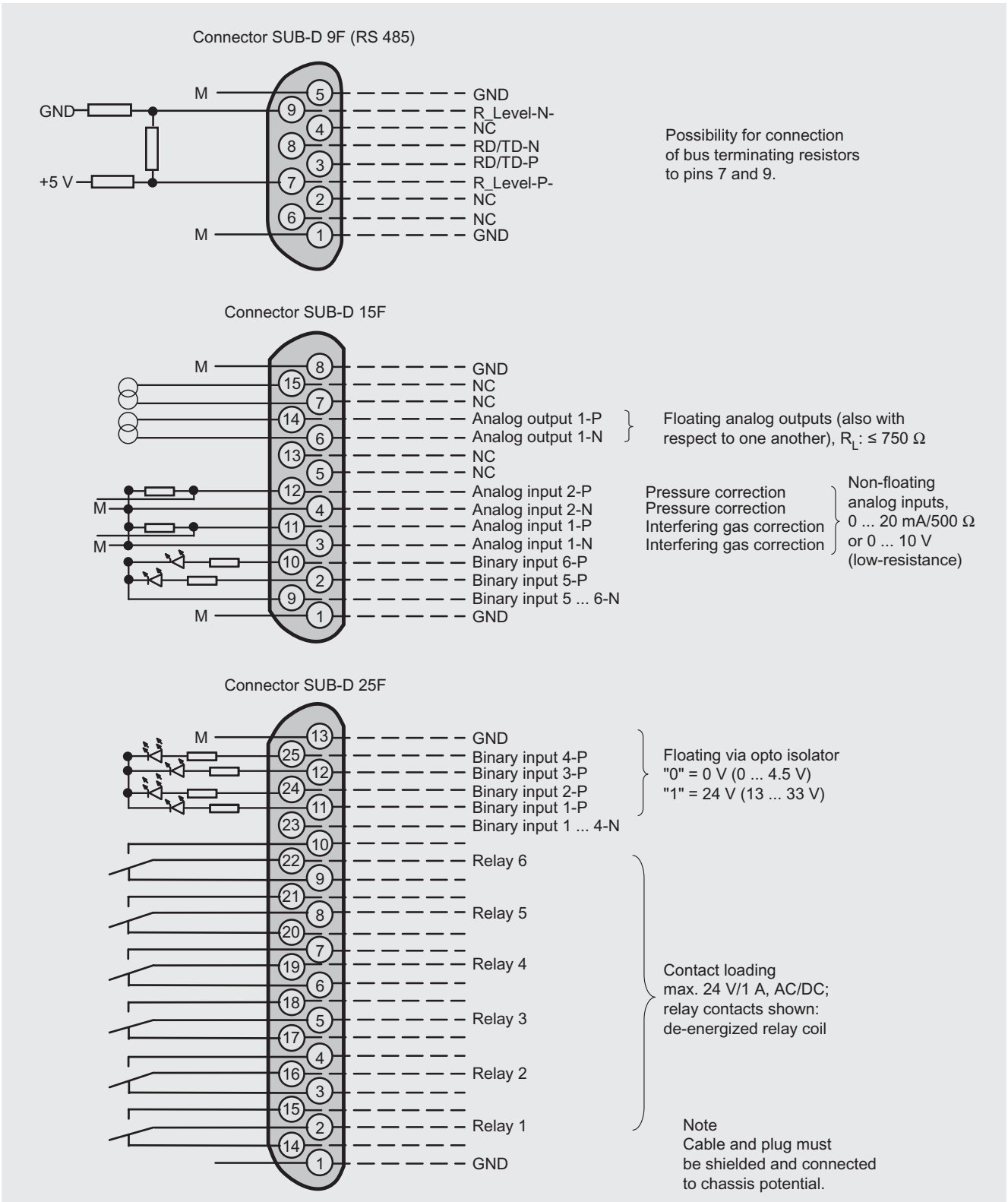


CALOMAT 6, 19“ unit, dimensions in mm

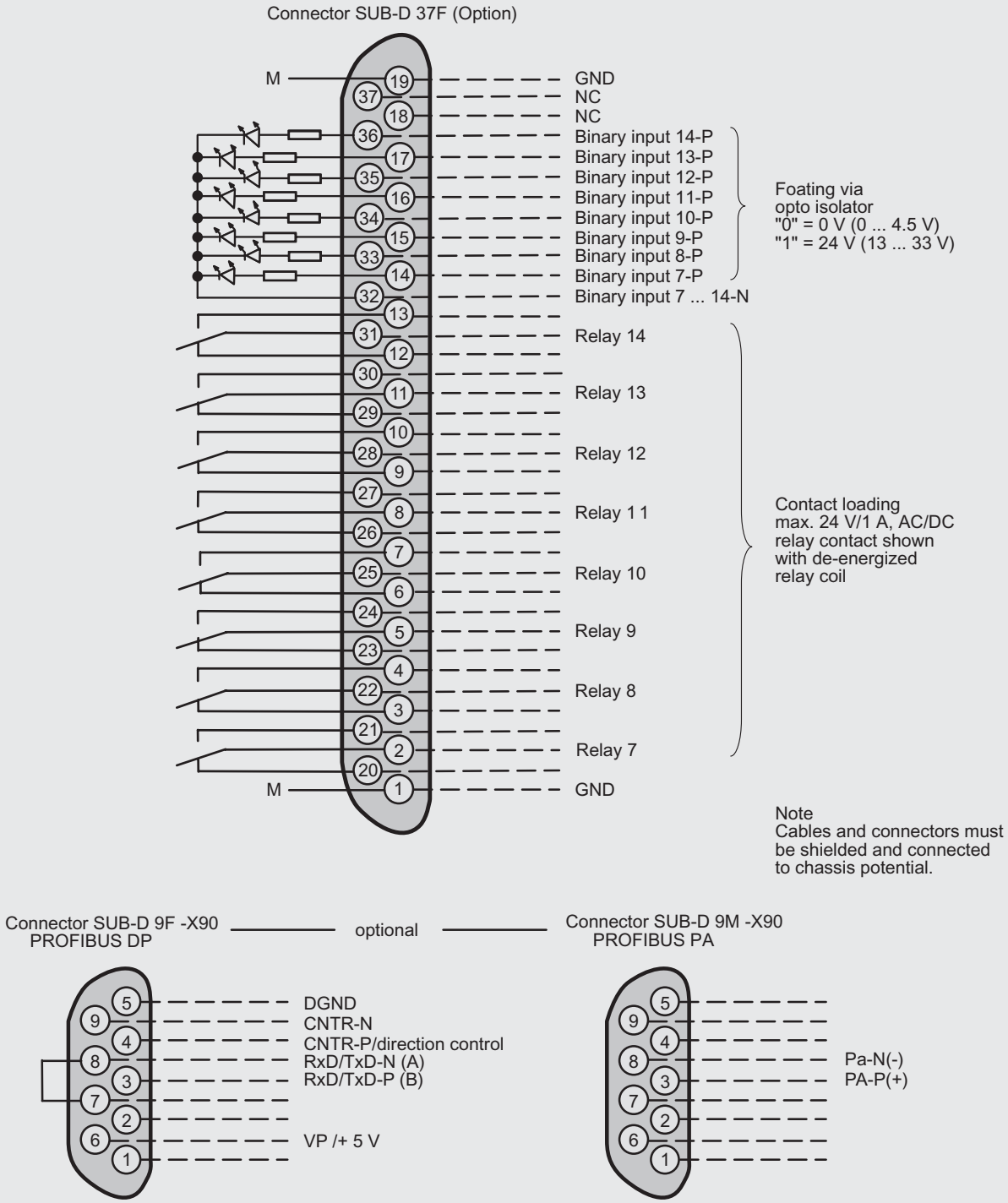
19" unit

Schematics

Pin assignment (electrical and gas connections)

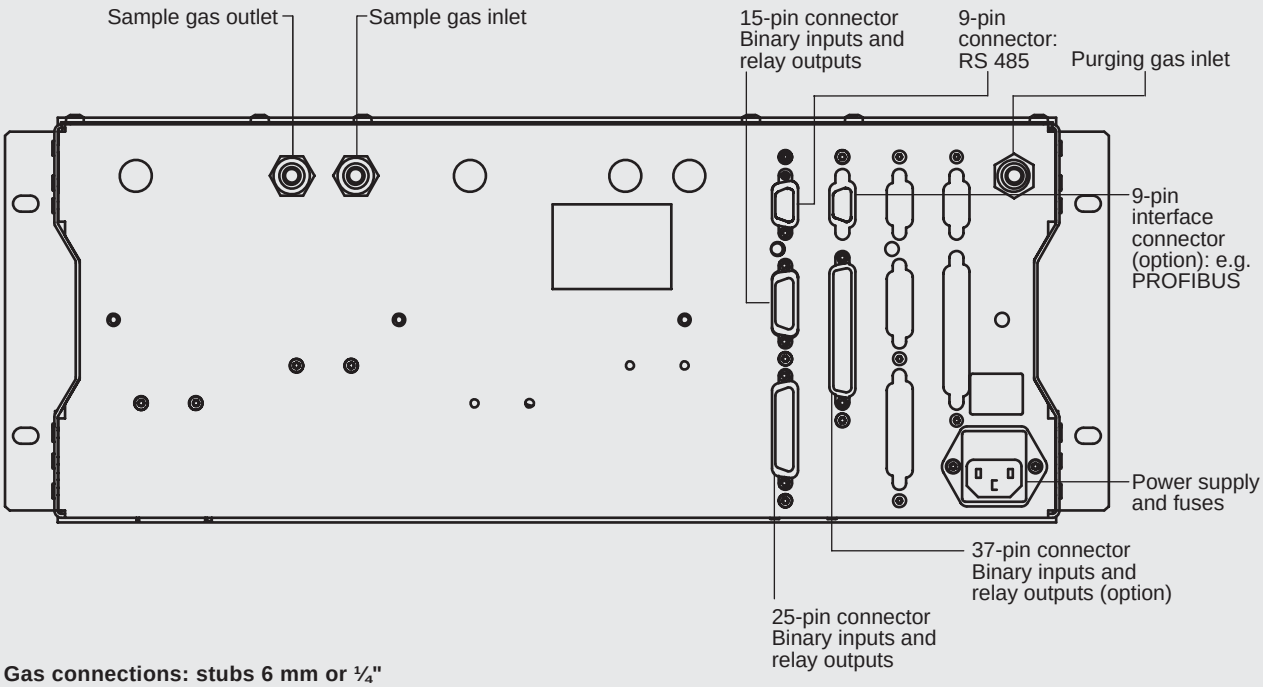


CALOMAT 6, 19“ unit, pin assignment



CALOMAT 6, 19“ unit, pin assignment of Autocal board and PROFIBUS connectors

19" unit



CALOMAT 6, 19“ unit, gas and electrical connections

Technical specifications

General (following DIN EN 61207 / IEC 1207. All data referred to binary gas mixture H_2 in N_2)

Measuring ranges	4, switchable internally and externally; autoranging is also possible
Largest possible measuring span	100% H_2 (smallest span see „Function“)
Measuring ranges with suppressed zero	Any zero point within 0 ... 100% can be achieved; smallest possible measuring span 5% H_2
Position of use	Front panel vertical
Conformity	CE identification EN 61326/A1, EN 61010/1

Design, enclosure

Degree of protection	IP65 according to EN 60529
Weight	Approx. 25 kg

Electrical characteristics

EMC interference immunity (**E**lectro**M**agnetic **C**ompatibility) (all signal wires must be shielded; variations of up to 4% of the smallest range may appear in ranges with strong electromagnetic interferences)	According to standard requirements of NAMUR NE21 (08/98)
Electrical safety	According to EN 61010-1; overvoltage category II
Power supply (see rating plate)	100 -10 % ... 120 V AC +10 %, 48 ... 63 Hz or 200 -10 % ... 240 V AC +10 %, 48 ... 63 Hz
Power consumption	Approx. 20 VA
Fuse links	100 ... 120 V: 1.0T/250 200 ... 240 V: 0.63T/250

Gas inlet conditions

Sample gas pressure	800 … 1100 hPa (absolute)
Sample gas flow	30 … 90 l/h (0.5 … 1.5 l/min)
Sample gas temperature	0 … 50 °C
Sample cell temperature	Approx. 60 °C
Sample gas humidity	< 90% relative humidity
Purging gas pressure	
• permanent	165 hPa above environment
• for short periods	max. 250 hPa above environment

Time response (referred to 1000 hPa absolute sample gas pressure, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Warm-up period	< 30 min (maximum accuracy achieved after 2 hours)
Response time (T_{90})	< 5 s
Electric damping	0 … 100 s, programmable
Dead time (at 1 l/min)	Approx. 0.5 s

Measuring response (referred to 1000 hPa absolute sample gas pressure, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Output signal fluctuation (maximum accuracy achieved after 2 hours)	< ± 0.75% of smallest possible measuring range specified on rating plate with an electronic time constant of 1 s (σ = 0.25%)
Zero drift	< 1%/week of smallest possible measuring span specified on rating plate
Repeatability	< 1% of respective measuring span
Minimum detection limit	1% of current measuring range
Linearity error	< ± 1% of respective measuring span

Influencing variables (referred to 1000 hPa absolute sample gas pressure, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Ambient temperature	< 1%/10 K referred to the smallest possible measuring span according to rating plate
Residual gases	Deviation in zero point (interfering gas influence see “Function“)
Sample gas flow	< 0.2% of smallest possible measuring span according to rating plate with a change in flow of 0.1 l/h within the permissible flow range
Sample gas pressure	< 1% for a pressure variation of 100 hPa
Power supply	< 0.1% of output signal span with rated voltage ± 10%

Electric inputs and outputs

Analog output	0/2/4 … 20 mA, floating; max. load 750 Ω
Relay outputs	6, with changeover contacts, freely selectable, e.g. for range identification; loading capacity: 24 V AC/DC/ 1 A, floating
Analog inputs	2, designed for 0/2/4 … 20 mA, for external pressure sensor and correction of influence of residual gas
Binary inputs	6, designed for 24 V, floating, freely-selectable, e.g. for range switching
Serial interface	RS 485
Options	Autocal function with 8 binary inputs and 8 relay outputs; also with PROFIBUS PA or PROFIBUS DP

Ambient conditions

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

CALOMAT 6

Field unit

Selection and Ordering Data		Order No. 7MB2511-	cannot be combined
CALOMAT 6 gas analyzer for field mounting		■■■0■-■■■	
Gas connections for sample gas			
Ferrule screw for pipe, outer diameter 6 mm		0	
Ferrule screw for pipe, outer diameter 1/4“		1	
Measured component	**Smallest meas. range**		
H_2 in N_2	0-1/100%	AA	AA
H_2 in N_2 (blast furnace gas meas.)[1]	0-1/100%	AW	AW
H_2 in N_2 (converter gas meas.)[1]	0-1/100%	AX	AX
H_2 in N_2 (wood gasification)[1]	0-1/100%	AY	AY
H_2 in Ar	0-1/100%	AB	AB
H_2 in NH_3	0-1/100%	AC	AC
He in N_2	0-2/100%	BA	
He in Ar	0-2/100%	BB	
He in H_2	0-10/80%	BC	BC
Ar in N_2	0-10/100%	CA	
Ar in O_2	0-10/100%	CB	
CO_2 in N_2	0-20/100%	DA	
CH_4 in Ar	0-15/100%	EA	EA
NH_3 in N_2	0-10/30%	FA	FA
H_2 monitoring (turbo-alternators)		GA	GA
CO_2 in air	0-100%		
H_2 in CO_2	0-100%		
H_2 in air	80-100%		
Supplementary electronics			
Without		0	
Autocal function			
• With additional 8 binary inputs/outputs		1	
• With additional 8 binary inputs/outputs and PROFIBUS PA interface		6	6
• With additional 8 binary inputs/outputs and PROFIBUS DP interface		7	7
• With additional 8 binary inputs/outputs and PROFIBUS PA Ex i interface		8	8
Power supply			
100 V ... 120 V AC, 47 ... 63 Hz		0	
200 V ... 240 V AC, 47 ... 63 Hz		1	
Explosion protection			
Without		A	A → Y04
According to ATEX II 3G, non-flammable gases		B	B → A11, Y04
According to ATEX II 3G, flammable gases[2]		C	C → A11
Certificate CSA - Class I Div 2		D	D → A11, Y04
According to ATEX II 2G, leakage compensation[2]		E	E → A11
According to ATEX II 2G, continuous purging[2]		F	F → A11
Certificate ATEX II 3D; dust-explosion hazard zones			
• in safe areas		G	G → A11, Y04
• in Ex-Zone according to ATEX II 3G; non-flammable gases		H	H → A11, Y04
• in Ex-Zone according to ATEX II 3G; flammable gases[2]		J	J → A11
Language (documentation, software)			
German		0	
English		1	
French		2	
Spanish		3	
Italian		4	

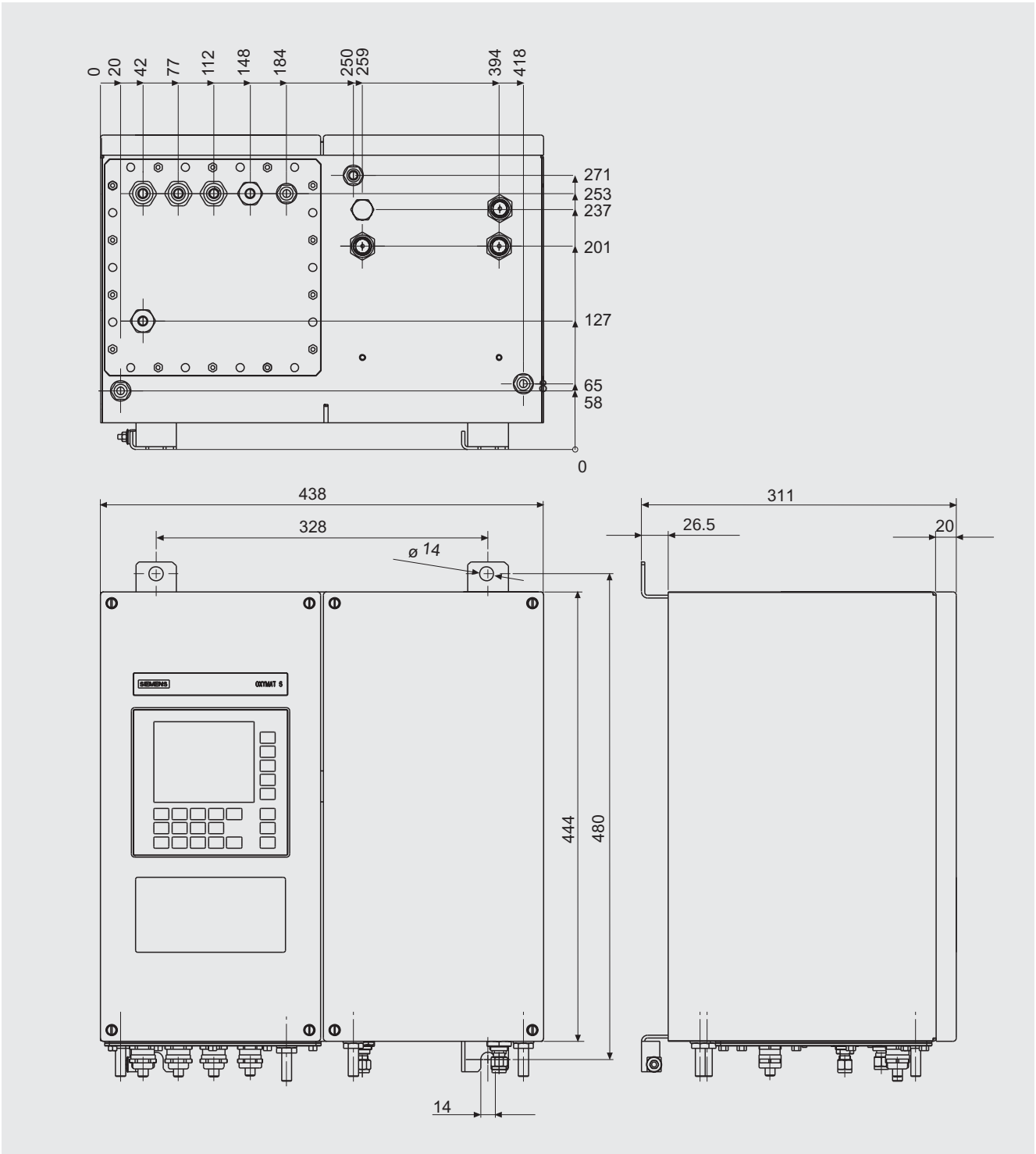
1) Prepared to supply external interfering gas corrections for CO, CO_2 and CH_4 (CH_4 only for blast furnace and converter gas measurement).
2) Only in conjunction with with an approved purging unit.

Selection and Ordering Data

Further versions	Order code
Please add „-Z“ to Order No. and specify Order code.	
Interface converter from RS 485 to RS 232	**A11**
Set of Torx tools, socket spanner	**A32**
TAG labels (customer-defined inscriptions)	**B03**
Clean for O_2-Service (specially cleaned gas path)	**Y02**
Measuring range in plain text if different from standard setting	**Y11**
Additional units for explosion-proof versions	Order No.
Category ATEX II 2G	
BARTEC EEx p control unit, 230 V, „leakage compensation“	**7MB8000-2BA**
BARTEC EEx p control unit, 115 V, „leakage compensation“	**7MB8000-2BB**
BARTEC EEx p control unit, 230 V, „continuous purging“	**7MB8000-2CA**
BARTEC EEx p control unit, 115 V, „continuous purging“	**7MB8000-2CB**
Explosion-protected isolation amplifier	**7MB8000-3AA**
Explosion-protected isolating relay, 230 V	**7MB8000-4AA**
Explosion-protected isolating relay, 110 V	**7MB8000-4AB**
Differential pressure switch for corrosive and non-corrosive gases	**7MB8000-5AA**
Flame arrester made of stainless steel	**7MB8000-6BA**
Flame arrester made of Hastelloy	**7MB8000-6BB**
Category ATEX II 3G	
BARTEC EEx p control unit (flammable gases)	**7MB8000-1BA**
FM /CSA (Class I Div. 2)	
Ex purging unit MiniPurge FM	**7MB8000-1AA**
Retrofitting sets	
RS 485/Ethernet converter	**C79451-A3364-D61**
RS 485/RS 232 converter	**C79451-Z1589-U1**
Autocal function with 8 binary inputs/outputs	**A5E00064223**
Autocal function with 8 binary inputs/outputs and PROFIBUS PA	**A5E00057315**
Autocal function with 8 binary inputs/outputs and PROFIBUS DP	**A5E00057318**
Autocal function with 8 binary inputs/outputs and PROFIBUS PA Ex i (requires Firmware 4.1.10)	**A5E00057317**

Field unit

Dimensional drawings

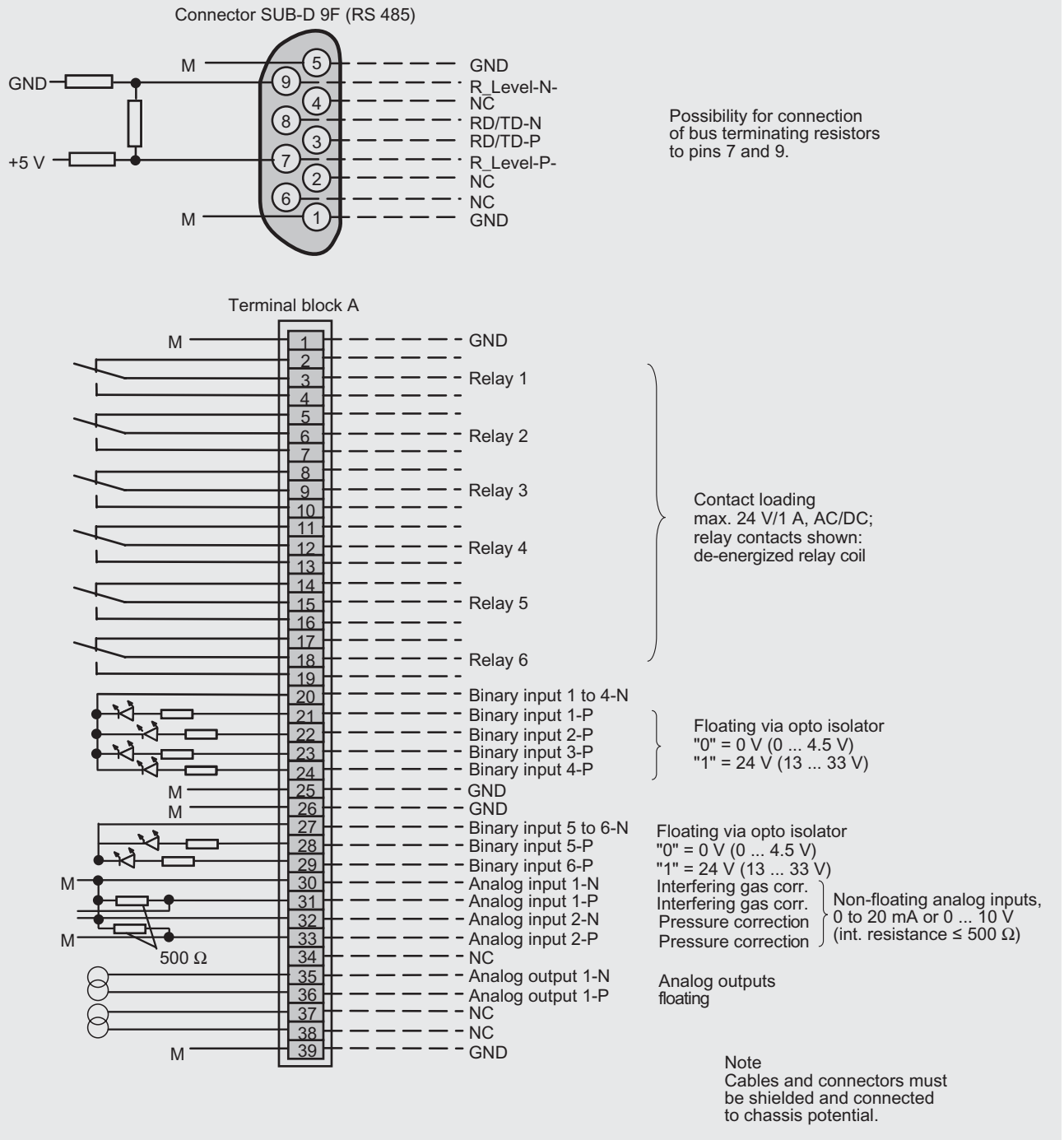


CALOMAT 6, field unit, dimensions in mm

2

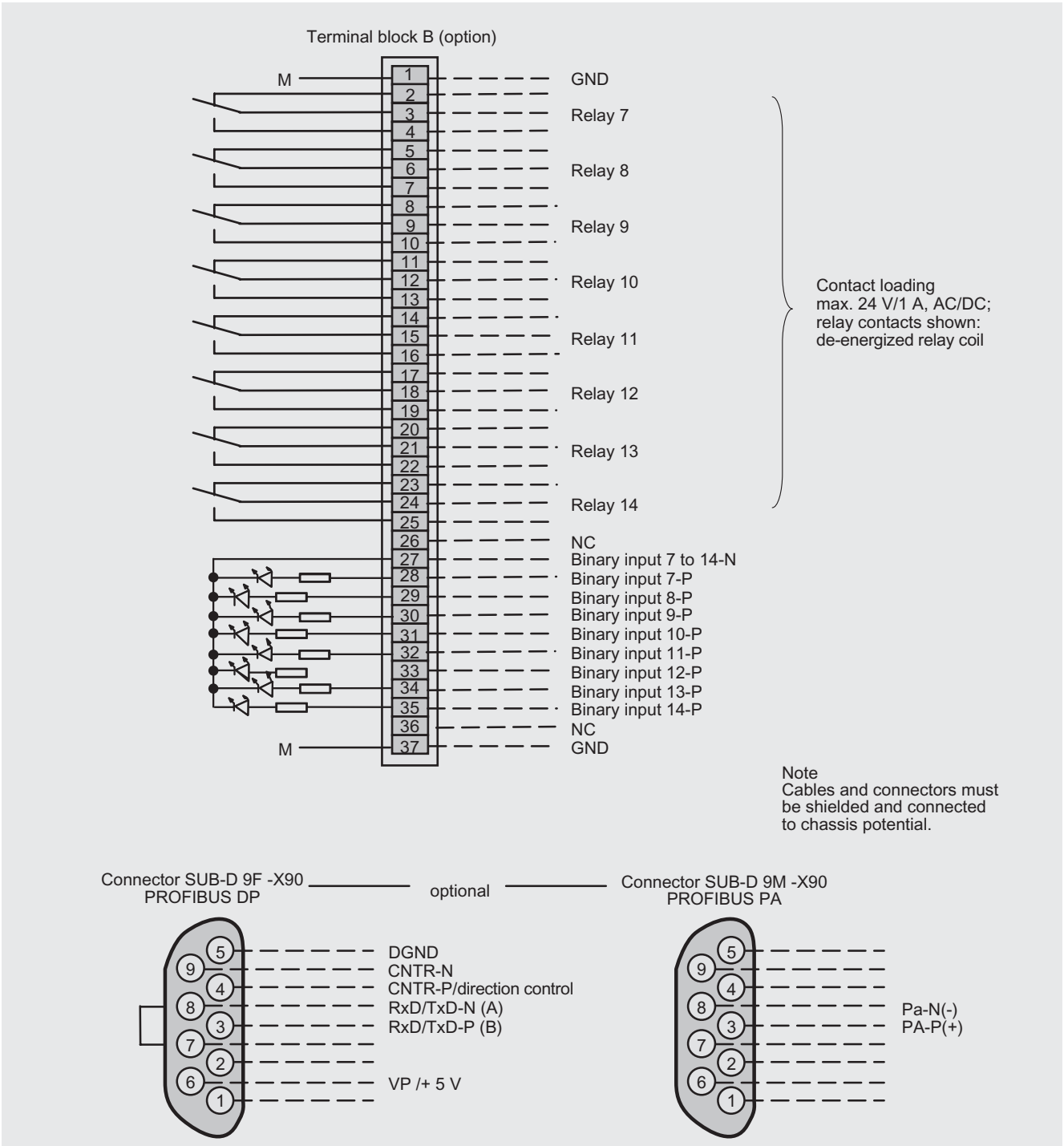
Schematics

Pin assignment (electrical and gas connections)

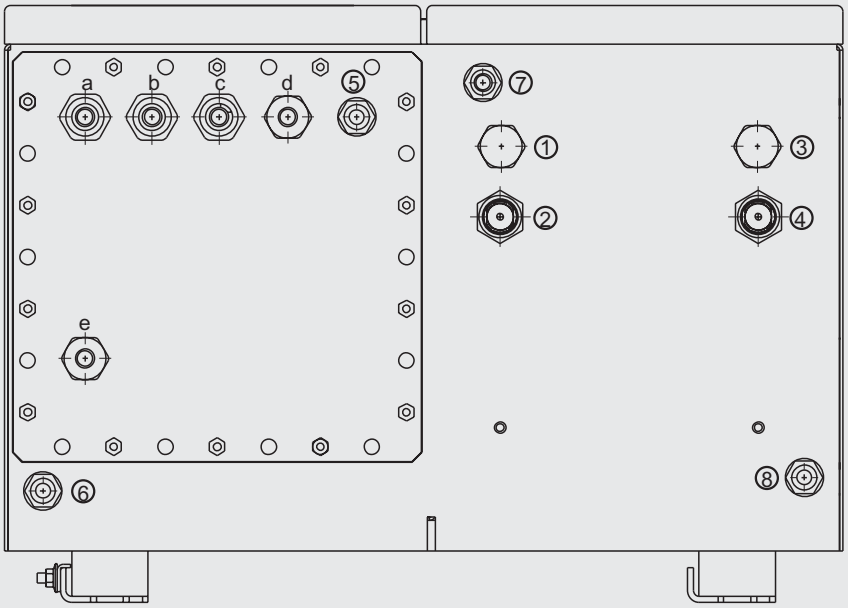


CALOMAT 6, field unit, connector and terminal assignment

Field unit



CALOMAT 6, field unit, connector and terminal assignment of the Autocal board and PROFIBUS connectors



Gas connections

①	not used	Clamping gland for pipe Ø 6 mm or ¼"
②	Sample gas inlet	
③	not used	
④	Sample gas outlet	
⑤-⑧	Purging gas inlets/outlets	stubs Ø 10 mm or ¼ "

Electrical connections

a - c	Signal cable (analog + digital): Pg 16
d	Interface connection: Pg 13,5
e	Power supply: Pg 13.5

CALOMAT 6, field unit, gas and electrical connections

Documentation

Selection and Ordering Data

Manual	Order No.
CALOMAT 6 Wärmeleitfähigkeitsgasanalysator (German)	**A5E00123066**
CALOMAT 6 Thermal Conductivity Gas Analyzer (English)	**A5E00123067**
CALOMAT 6 Analyseur de gaz à conductivité thermique (French)	**A5E00123068**
CALOMAT 6 Analizzatore di gas a conductivita termica (Italian)	**A5E00123069**
CALOMAT 6 Analizador de gases por conductividad termica (Spanish)	**A5E00123070**
ULTRAMAT 6, OXYMAT 6, OXYMAT 61, CALOMAT 6, ULTRAMAT 23 Schnittstelle/Interface PROFIBUS DP/PA (German and English)	**A5E00054148**

Selection and Ordering Data

	7MB2521	7MB2511	7MB2511 Ex	2 years (qty)	5 years (qty)	Order No.
Analyzer section						
Sample cell	x	x	x	1	1	**A5E00095332**
O-ring (set of 10)	x	x	x	1	2	**A5E00124182**
Electronics						
Fuse link (miniature fuse)			x	1	2	**A5E00061505**
Front panel without LCD display	x			1	1	**C79165-A3042-B508**
Base plate, without firmware	x	x	x	—	1	**C79451-A3474-B601**
Adapter board, LCD/keyboard	x	x		1	1	**C79451-A3474-B605**
LC display (non-Ex version)	x			1	1	**W75025-B5001-B1**
Mains transformer, 115 V	x	x	x	—	1	**W75040-B21-D80**
Mains transformer, 230 V	x	x	x	—	1	**W75040-B31-D80**
Connector filter	x	x	x	—	1	**W75041-E5602-K2**
Fuse link, T 0.63/250 V	x	x		2	4	**W79054-L1010-T630**
Fuse link, 1A, 110/120 V	x	x	x	2	4	**W79054-L1011-T100**

If the CALOMAT 6 was delivered with specially cleaned gas path for high oxygen content (so-called "Cleaned for O_2 service"), please absolutely specify it for a spare part order. This is the only way to guarantee that the gas path furthermore corresponds to the special requirements for this variant.

CALOMAT 6