Technical specifications

General information	Based on DIN EN 61207/IEC 1207. All data based on digital gas mixture H_2 in N_2
Measuring ranges	4, internally and externally switchable; automatic measuring range changeover also possible
Largest possible measuring span	100 vol.% H_2 (for smallest measuring span, see "Function")
Measuring ranges with suppressed zero point	Any zero point within 0 ... 100 vol.% can be implemented; smallest possible measuring span: 5% H_2
Operating position	Front wall, vertical
Conformity	CE mark in accordance with EN 61326/A1 and EN 61010/1
Design, enclosure	
Degree of protection	IP65 according to EN 60529
Weight	Approx. 25 kg
Electrical characteristics	
EMC interference immunity (electromagnetic compatibility)	In accordance with standard requirements of NAMUR NE21 (08/98)
All signal lines must be shielded. Measured value deviations of up to 4% of the smallest measuring range may occur in ranges with strong electromagnetic interference.	
Electrical safety	In accordance with EN 61010-1; overvoltage category II
Auxiliary power (see nameplate)	100 V -10% ... 120 V +10% AC, 48 ... 63 Hz or 200 V -10% ... 240 V +10% AC, 48 ... 63 Hz
Power consumption (unit)	Approx. 20 VA
Fuse values	100 to 120 V: 1.0T/250 200 ... 240 V: 0.63 T/250
Gas inlet conditions	
Sample gas pressure	800 to 1 100 hPa (absolute)
Sample gas flow	30 to 90 l/h (0.5 to 1.5 l/min)
Sample gas temperature	Min. 0 to max. 50 °C, but above the dew point
Temperature of the measuring cell	Approx. 60 °C
Sample gas humidity	< 90% relative humidity
Purging gas pressure	
• Permanent	165 hPa above ambient pressure
• For short periods	Max. 250 hPa above ambient pressure
Time response	Based on sample gas pressure 1 000 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature
Warm-up period	< 30 min (the technical specification will be met after 2 hours)
Delayed display (T_{90})	< 5 s
Electrical damping	0 ... 100 s, configurable
Dead time (at 1 l/min)	Approx. 0.5 s

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 (maximum accuracy achieved after 2 hours)	< ± 0.75% of the smallest possible measuring range according to rating plate, with electronic damping constant of 1 s (σ = 0.25%)
Zero point drift	< ± 1%/week of the smallest possible measuring span according to rating plate
Measured-value drift	< ± 1%/week of the smallest possible measuring span according to rating plate
Repeatability	< 1% of the current measuring range
Detection limit	1% of the current measuring range
Linearity error	< ± 1% of the current measuring range
Influencing variables	Based on sample gas pressure 1013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature
Ambient temperature	< 1%/10 K referred to smallest possible measuring span according to rating plate
Accompanying gases	Deviation from zero point (for influence of interfering gas, see section "Cross-interference")
Sample gas flow	< 0.2% of the smallest possible span according to rating plate with a change in flow of 0.1 l/min within the permissible flow range
Sample gas pressure	< 1% of the current measuring range with a pressure change of 100 hPa
Electrical inputs and outputs	
Analog output	0/2/4 ... 20 mA, floating; load max. 750 Ω
Relay outputs	6, with changeover contacts, freely configurable, e.g. for measuring range identification; load: 24 V AC/DC/1 A, floating
Analog inputs	2, dimensioned for 0/2/4 ... 20 mA for external pressure sensor and 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 in operation
Permissible humidity (dew point must not be fallen below)	< 90% relative humidity as annual average, during storage and transportation

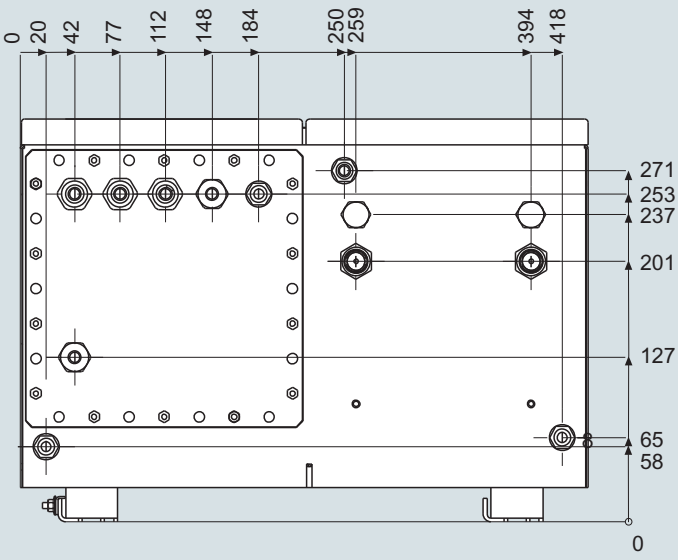
Selection and ordering data		Article No.	Cannot be combined
CALOMAT 6 gas analyzer For field installation		↗ 7MB2511- ■■■0■-■A■■	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Connections for sample gas			
Ferrule screw connection for pipe, outer diameter 6 mm		0	
Ferrule screw connection for pipe, outer diameter 1/4"		1	
Measured component	Smallest/largest measuring range		
H_2 in N_2	0 ... 1/100 %	A A	A A
H_2 in N_2 (blast furnace gas measurement)[1]	0 ... 5/100 %	A W	A W
H_2 in N_2 (converter measurement)[1]	0 ... 5/100 %	A X	A X
H_2 in N_2 (wood gasification)[1]	0 ... 5/100 %	A Y	A Y
H_2 in Ar	0 ... 1/100 %	A B	A B
H_2 in NH_3	0 ... 1/100 %	A C	A C
He in N_2	0 ... 2/100 %	B A	
He in Ar	0 ... 2/100 %	B B	
He in H_2	0 ... 10/80 %	B C	B C
Ar in N_2	0 ... 10/100 %	C A	
Ar in O_2	0 ... 10/100 %	C B	
CO_2 in N_2	0 ... 20/100 %	D A	
CH_4 in Ar	0 ... 15/100 %	E A	E A
NH_3 in N_2	0 ... 10/30 %	F A	F A
H_2 monitoring (turbo generators)		G A	G A GA
• CO_2 in air	0 ... 100 %		
• H_2 in CO_2	0 ... 100 %		
• H_2 in air	80 ... 100 %		
Add-on electronics			
Without		0	
AUTOCAL function			
• With 8 additional digital inputs and outputs		1	
• With 8 additional digital inputs/outputs and PROFIBUS PA interface		6	6 6
• With 8 additional digital inputs/outputs and PROFIBUS DP interface		7	7 7
• With 8 additional digital inputs/outputs and PROFIBUS PA Ex-i interface		8	8 8
Power supply			
100 ... 120 V AC, 48 ... 63 Hz		0	
200 ... 240 V AC, 48 ... 63 Hz		1	
Explosion protection, incl. certificate			
Without		A	
Acc. to ATEX II 3G, non-flammable gases		B	B
Acc. to ATEX II 3G; flammable gases[2]		C	
FM/CSA certificate – Class I Div 2		D	D
According to ATEX II 2G, leakage compensation[2]		E	E
According to ATEX II 2G, continuous purging[2]		F	F
ATEX II 3D certificate; potentially explosive dust atmospheres			
• In non-hazardous gas zone		G	
• In Ex zone acc. to ATEX II 3G, non-flammable gases		H	
• In Ex zone acc. to ATEX II 3G, flammable gases[2]		J	
Language (supplied documentation, software)			
German		0	
English		1	
French		2	
Spanish		3	
Italian		4	

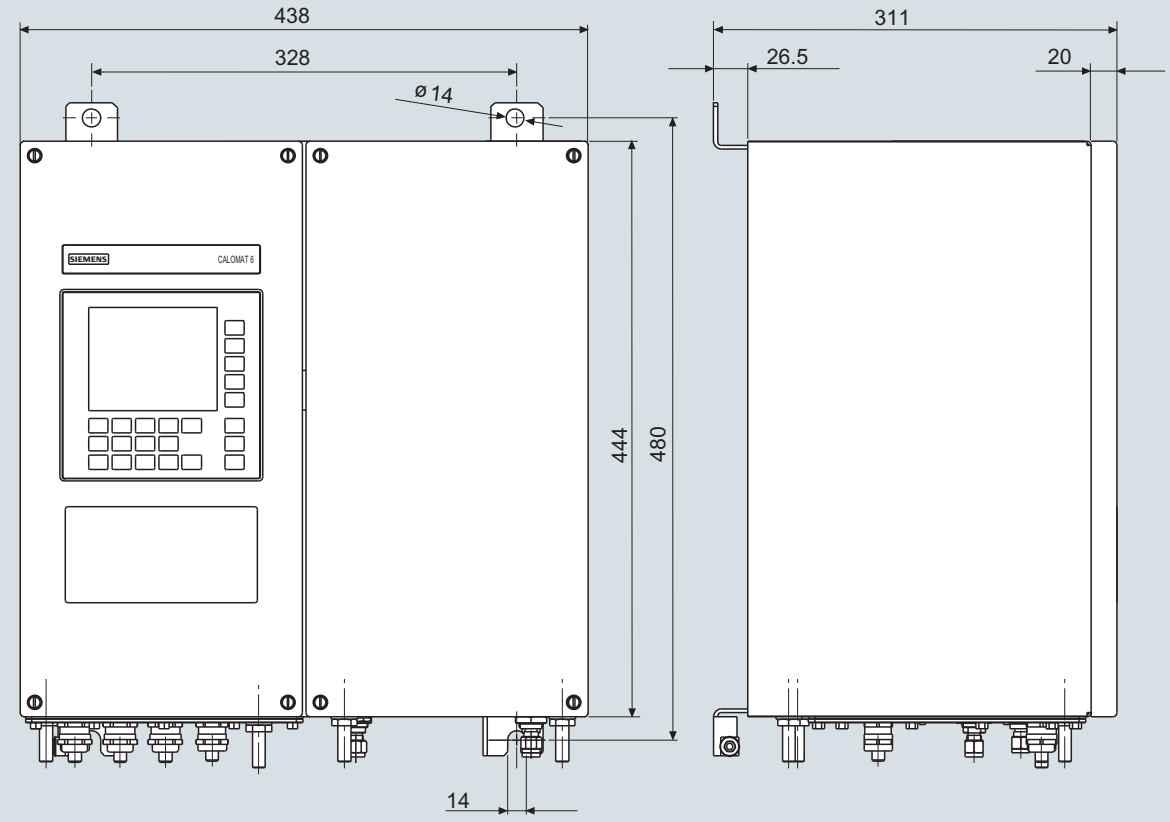
[1] Ready to enter external correction of cross-interferences for CO, CO_2 and CH_4 (CH_4 only for blast furnace gas and wood gasification).
[2] Only in connection with an approved purging unit.

Selection and ordering data

Additional versions	**Order code**
Add "-Z" to Article No. and specify Order codes.	
TAG labels (specific lettering based on customer information)	**B03**
BARTEC Ex p purging unit "Leakage compensation"	**E71**
BARTEC Ex p purging unit "Continuous purging"	**E72**
Clean for O_2 service (specially cleaned gas path)	**Y02**
Measuring range indication in plain text, if different from the standard setting	**Y11**
Additional units for Ex versions	**Article No.**
ATEX Category II 2G (zone 1)	
BARTEC Ex p purging unit, 230 V, "leakage compensation"	**7MB8000-2BA**
BARTEC Ex p purging unit, 115 V, "leakage compensation"	**7MB8000-2BB**
BARTEC Ex p purging unit, 230 V, "continuous purging"	**7MB8000-2CA**
BARTEC Ex p purging unit, 115 V, "continuous purging"	**7MB8000-2CB**
Ex i isolating transformer	**7MB8000-3AB**
Ex isolating relay, 230 V	**7MB8000-4AA**
Ex isolating relay, 110 V	**7MB8000-4AB**
Differential pressure switch for corrosive and non-corrosive gases	**7MB8000-5AA**
Stainless steel flame arrestor	**7MB8000-6BA**
Hastelloy flame arrestor	**7MB8000-6BB**
ATEX Category II 3G (zone 2)	
BARTEC Ex p purging unit, 230 V, "continuous purging"	**7MB8000-2CA**
BARTEC Ex p purging unit, 115 V, "continuous purging"	**7MB8000-2CB**
FM/CSA (Class I Div. 2)	
Ex purging unit Minipurge FM	**7MB8000-1AA**
Accessories	
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**

Dimensional drawings

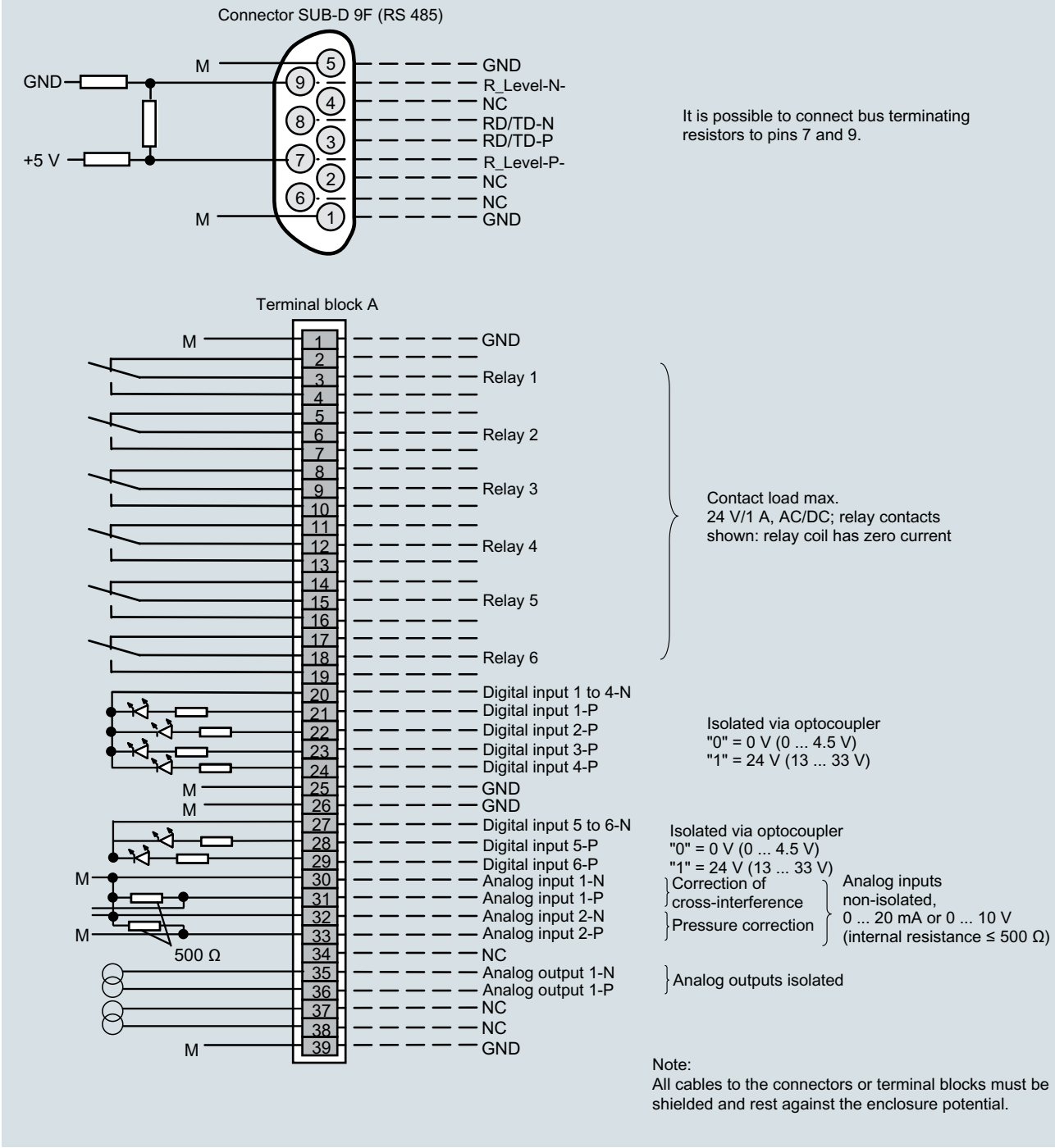




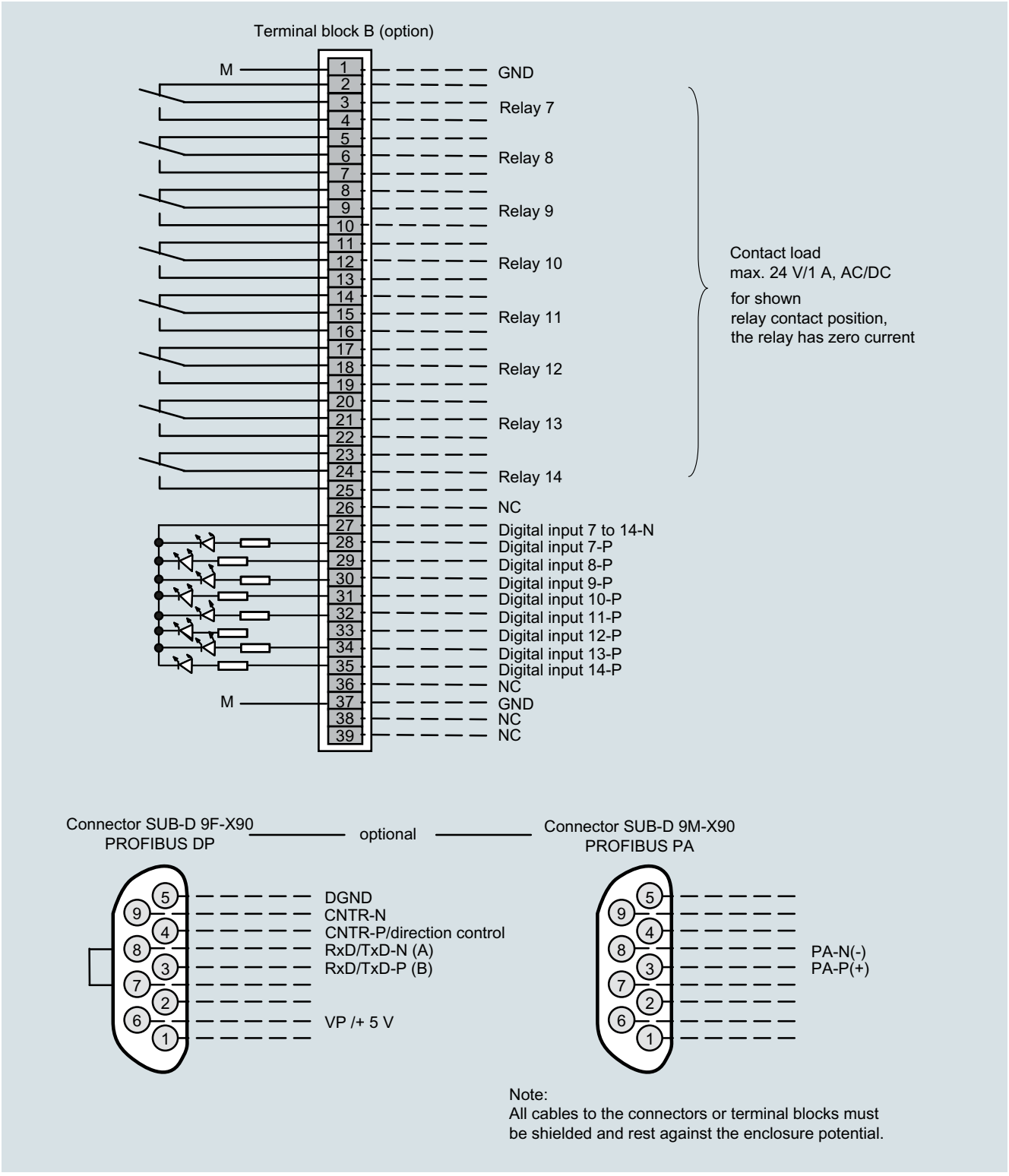
CALOMAT 6, field unit, dimensions in mm

Circuit diagrams

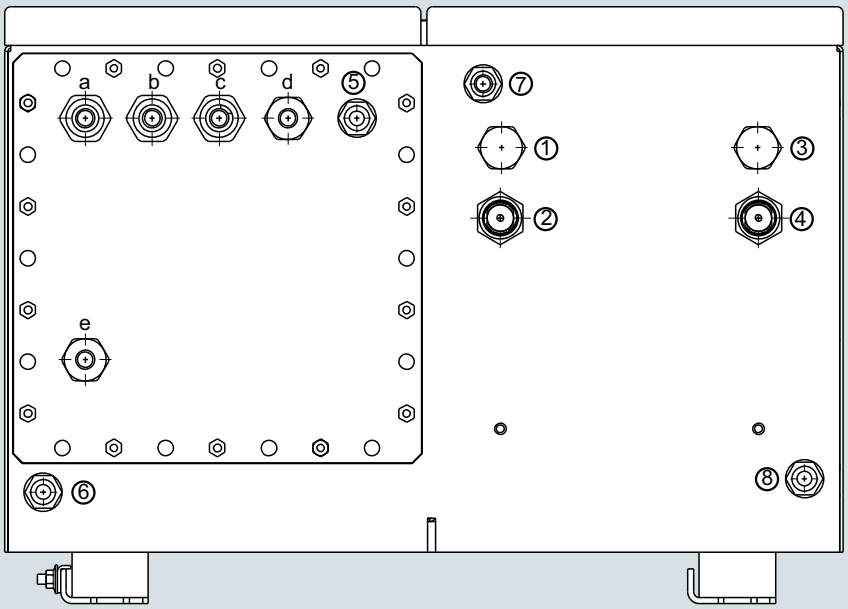
Pin assignment (electrical and gas connections)



CALOMAT 6, field unit, connector and terminal assignment



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 3/8 "	

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

CALOMAT 6, field unit, gas and electrical connections