

Overview



FIDAMAT 6

The FIDAMAT 6 gas analyzer is suitable for the determination of the total hydrocarbon content in the air and high-boiling gas mixtures.

Benefits

The FIDAMAT 6 gas analyzer stands out for its wide range of applications:

- where up to 100% H₂O steam is present
- in high-purity gas applications
- with high-boiling components (up to 200 °C)
- where corrosive gases are present (with pre-filter).

The FIDAMAT 6 has:

- extremely low cross sensitivity to interference gases
- low combustion air consumption
- low oxygen influence on measured value.

The device is also equipped with warning and fault messages:

- in the event of combustion gas failure
- if the flame is extinguished
- to indicate faults in the pump and filter

Application

Application areas

- Environmental protection
- Wastewater (in conjunction with a stripping device, verification of the hydrocarbon content of liquids)
- Measurement of flue gases in accordance with German emission protection legislation and air purity guidelines for fuel types oil, coal, gas, and waste (with German Technical Inspectorate approval)
- TLV (Threshold Limit Value) monitoring at places of work
- Quality monitoring
- Process exhaust monitoring
- High-purity gas measurement in media such as O₂, CO₂, inert gases and cold sample gases
- Measurement of corrosive and condensing gases
- Process optimization

Further applications

- Chemical plants
- Gas manufacturers (high-purity gas monitoring)
- Research and development
- Cement industry (measurement of emissions)
- Paint shops and dry-cleaning systems
- Refineries (tank storage, waste water)
- Drying systems
- Solvent recovery systems
- Pharmaceuticals industry
- Automobile industry (engine development, engine and transmission development and certification)

Special applications

Special applications are available on request in addition to the standard combinations.

Continuous Gas Analyzers, extractive

FIDAMAT 6

General

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 (laptop connection)
- Gas connections for sample gas input and output as well as combustion gas and combustion air, pipe diameter 6 mm or 1/4"
- Gas and electrical connections at the rear
- Internal gas paths: stainless steel (type No. 1.4571)

Display and control panel

- Large LCD panel for simultaneous display of:
 - Measured value
 - Status line
 - Measuring ranges
- Contrast of LCD panel adjustable via 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

Inputs and outputs

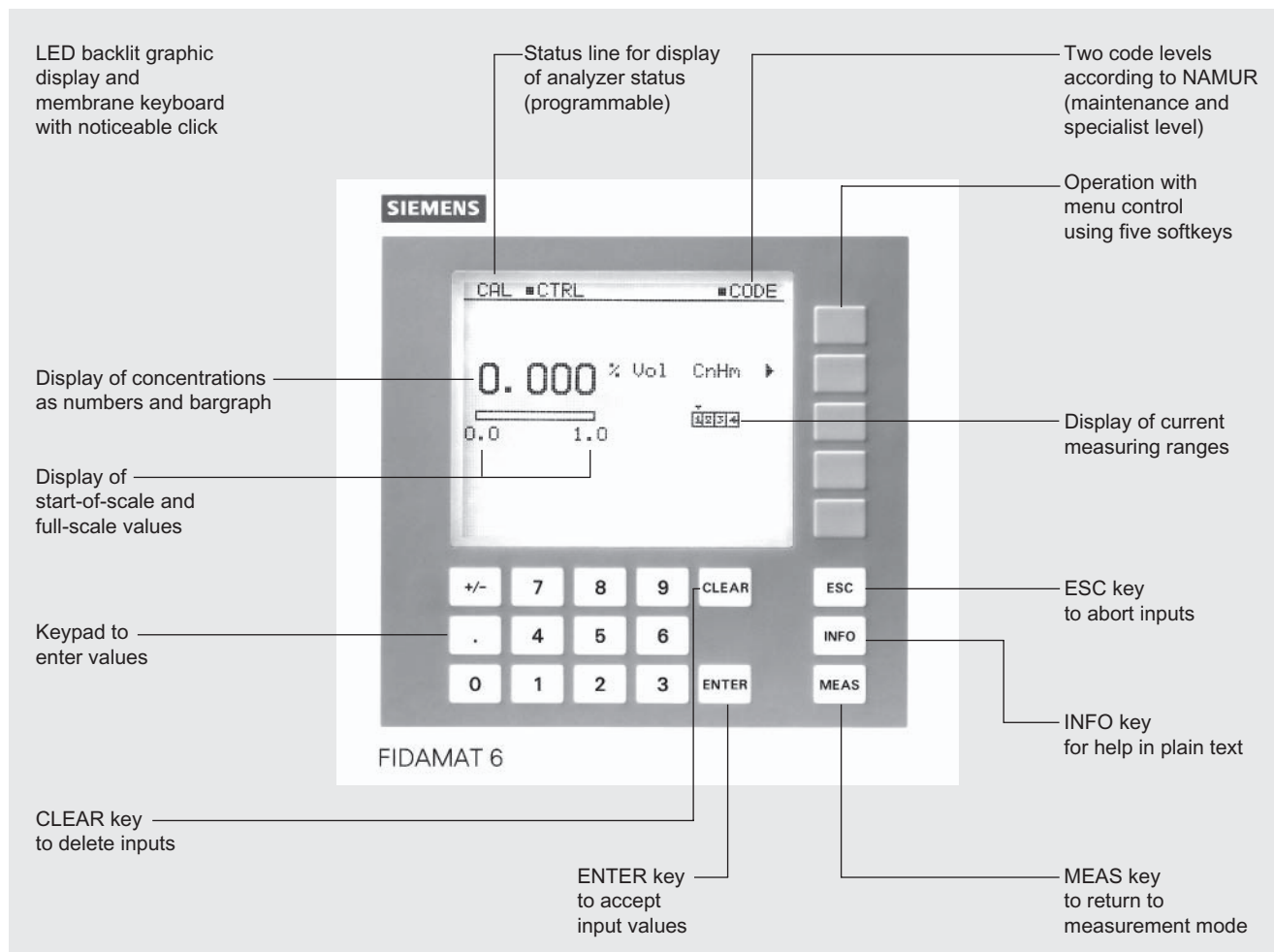
- One analog output for each measured component
- Two programmable analog inputs
- Six binary inputs freely configurable (e.g. for range switching, processing of external signals from sample preparation)
- Six relay outputs freely configurable (failure, maintenance request, maintenance switch, limit alarm, external solenoid valves, measuring point switchover)
- Extension with eight additional binary inputs and eight additional relay outputs for automatic calibration with up to four calibration gases

Communication

- RS 485 included in basic unit (connection at the rear)

Options

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



FIDAMAT 6, membrane keyboard and graphic display

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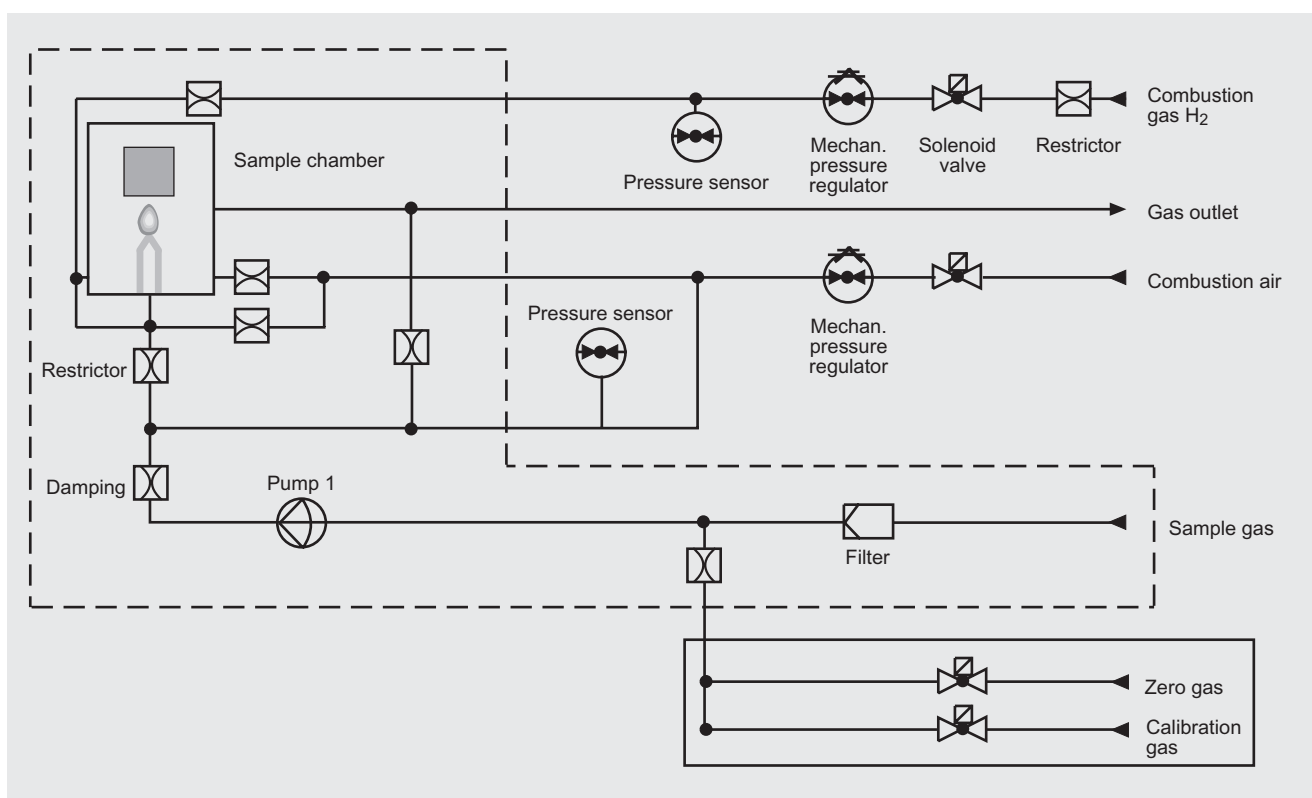
General

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Executions of the wetted parts

Gas path	19" unit
Tubing	SS, type No. 1.4571
Gas inlet	SS, type No. 1.4571
Gaskets	Graphite
Sample gas restrictor	Quartz
Auxiliary gas restrictors	SS, type No. 1.4571
Pump membrane	PTFE
Pump head	SS, type No. 1.4571
Detector	
• Nozzle	Quartz
• FID housing	SS, type No. 1.4571

Gas path



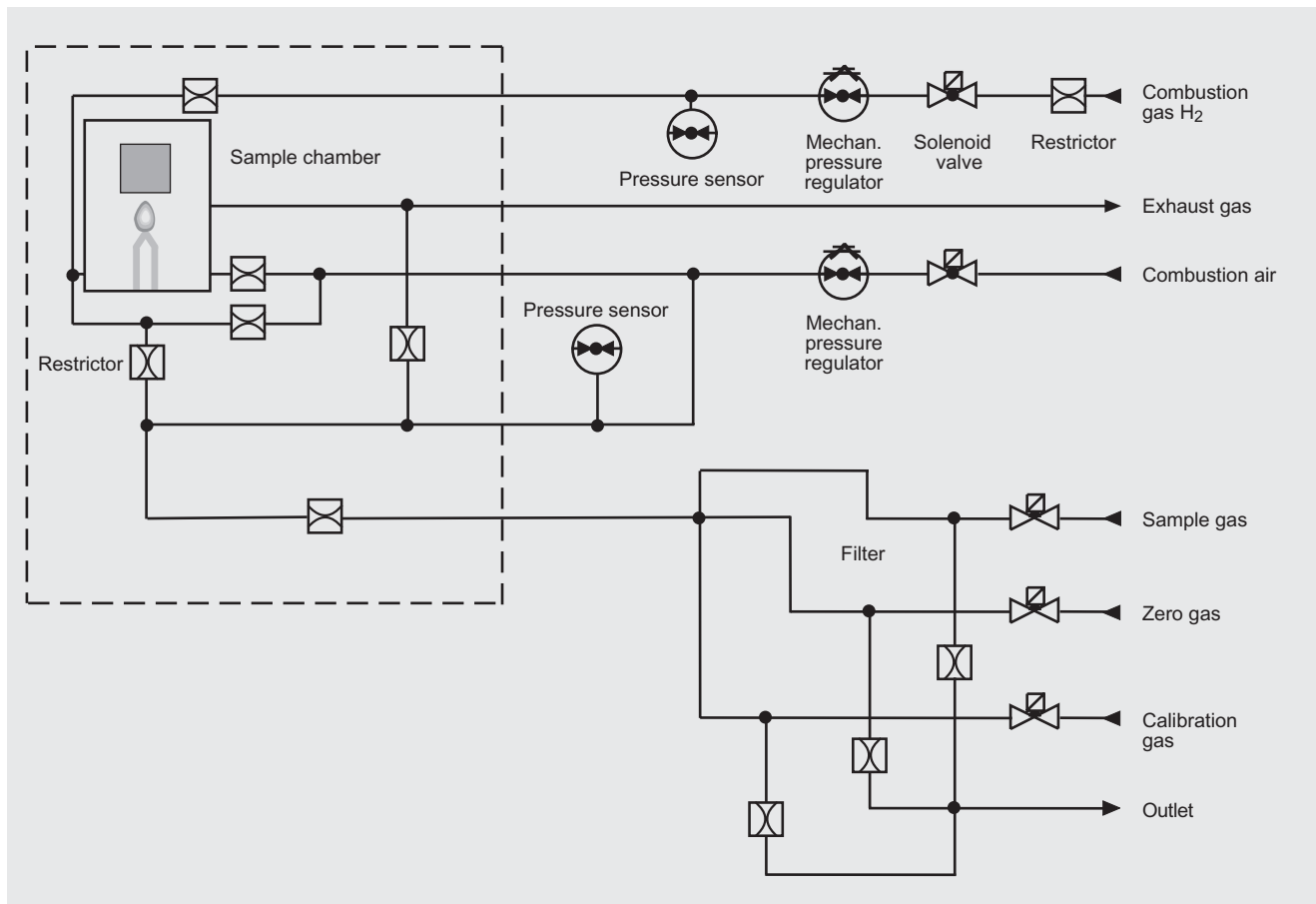
FIDAMAT 6 gas analyzer for determining the total hydrocarbon content, gas path with pump and with connection for combustion air

Continuous Gas Analyzers, extractive

FIDAMAT 6

General

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FIDAMAT 6 gas analyzer for determining the total hydrocarbon content, gas path without pump and with connection for combustion air

Function

Mode of operation

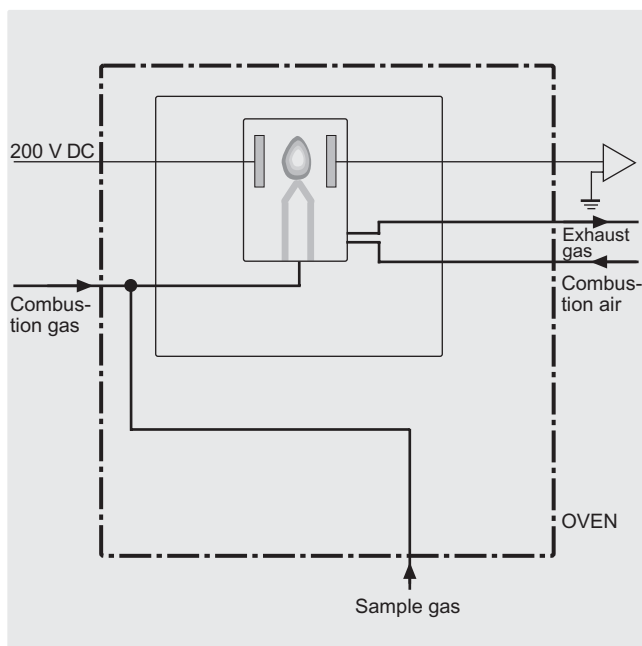
The FIDAMAT 6 performs substance-specific measurement and not component-specific measurement. It measures the total of all hydrocarbons in a sample gas, although with different weighting of the hydrocarbon molecules. At initial exposure, the display is proportional to the number of C atoms in the molecule in question. There are fluctuations in practice, however. The display deviation for the relevant molecule is expressed by the response factor.

The sample gas is supplied to the FIDAMAT 6 under overpressure or drawn in by the built-in diaphragm pump (optionally via a heated line and an additional filter) and passed into the flame ionization detector via an obstruction-proof fused-silica restrictor.

In the detector, the hydrocarbons in the sample gas are burned in a detonating gas flame. Burning partially ionizes the proportion of organically-bound hydrocarbons. The released ions are converted into a stream by the tension between two electrodes and measured using a highly sensitive amplifier. The current measured is proportional to the quantity of organically-bound C atoms in the sample gas.

A pressure regulator holds the combustion gas pressure constant. The balanced system of pump, capillary tubes, and combustion air ensures that the sample gas pressure is kept constant.

When the analyzer is switched on, ignition and, for versions "with pump", pump startup are automatic when the setpoint temperature has been reached.



FIDAMAT 6, mode of operation

The FIDAMAT 6 provides various messages in the form of floating contacts:

- Maintenance request
E.g. sample gas flow (filter/pump)
Fan failure (advance warning for measuring accuracy).
The measured value remains unaffected.
- Fault
E.g. hydrogen, combustion air, and sample gas pressure, temperature, physical part and pump, fault in the electronics (temperature).
The measured value can be influenced.
- Failure
In the event of failure of, for example, the electronics, voltage supply, combustion gas, combustion air and sample gas, the device automatically shuts down (the combustion gas valve is closed)

Note

The sample gas needs to be free of dust. Condensate in the cells must be avoided. That is why the most measuring tasks require an appropriate gas preparation.

Essential characteristics

- Four freely-parameterizable measuring ranges, also with suppressed zero point, all measuring ranges linear
- Galvanically isolated measured value output 0/2/4 to 20 mA (also inverted)
- Automatic measuring range switchover selectable, remote switchover also possible
- Storage of measured value during calibration possible
- Range identification
- Measuring-point selection for up to 6 measuring points
- Measuring point identification
- Time constants (static/dynamic noise suppression) can be selected within wide limits; this means the response time of the device can be adapted to the respective measuring task
- Simple handling thanks to menu operation
- Low long-term drift
- Two operation levels with separate authorization code to prevent unintentional and unauthorized use
- Parameterizable automatic measuring range calibration
- Operation based on the NAMUR recommendation
- Customized device versions such as:
 - Customer acceptance
 - TAG labels
 - Drift recording
- Wear-free, corrosion-proof filter housing
- No obstructions in the sample gas restrictors through the use of a quartz restrictor tube
- Purge function in the event of device failure and auxiliary power failure (avoids build-up of toxic and corrosive substances in the device)
- Low combustion air consumption
- Response factors comply with the minimum requirements in accordance with German air purity guidelines and the Working Group of the German Automobile Industry
- Simple operation with the help of a numeric membrane keyboard and operator prompting

Continuous Gas Analyzers, extractive

FIDAMAT 6

General

Response factors (examples, mean values)

Substance	Mean response factor
n-butane	1.00
n-propane	1.00
n-heptane	1.00
Cyclohexane	1.08
Isopropanol	0.81
Toluene	1.06
Acetone	0.94
Ethylacetate	0.77
Isobutyl acetate	0.83
Methane	1.06
Ethane	1.02
n-hexane	1.01
iso-octane	1.04
Ethine (acetylene)	0.91
Propene	0.84
Methanol	0.87
Ethanol	0.83
Ethanoic acid	1.13
Methyl acetate	0.67
Benzene	1.07
Ethylbenzene	0.96
p-xylene	1.03
Dichloromethane	0.96
Trichloroethene	1.01
Tetrachlorethene	1.07
Chloroform	0.72
Chlorobenzene	1.15

Cross influences (examples)¹⁾

Interference component	Concentration of the interference component	Induced cross influence
O ₂ in N ₂	(21 Vol.%)	< 0.3 mg/m ³
SO ₂ in N ₂	(258 mg/m ³)	< 0.15 mg/m ³
NO in N ₂	(310 mg/m ³)	< 0.5 mg/m ³
NO ₂ in synth. air	(146 mg/m ³)	< 0.1 mg/m ³
CO in N ₂	(461 mg/m ³)	< 0.15 mg/m ³
CO ₂ in N ₂	(18 Vol.%)	< 0.1 mg/m ³
HCl in N ₂	(78 mg/m ³)	< 0.3 mg/m ³

¹⁾ With measuring range 0 to 15 mg/m³.

Technical specifications**General**

Measuring ranges	4, internally and externally switchable; manual and automatic measuring range change-over possible
Smallest possible measuring span	0 ... 10 vpm
Largest possible measuring span	99.999 vpm
Concentration units	ppm, C ₁ , C ₃ , C ₆ or mgC/m ³
Automatic measuring range changeover	Hysteresis, selectable
Measured value display	Digital concentration display (5 digits with floating point)
Resolution of digital display	0.1% of measured value
Operating position	Front wall, vertical
Conformity	CE mark in accordance with EN 50081-1, EN 50082-2
Oven temperature	Adjustable, 100 ... 200 °C

Design, enclosure

Degree of protection	IP20 according ... EN 60529
Weight	Approximately 23 kg

Electrical characteristics

Auxiliary power	100 ... 120 V AC (rated range 90 ... 132 V), 48 ... 63 Hz or 200 ... 240 V AC (rated range 180 to 264 V), 48 ... 63 Hz
Power consumption	Approximately 150 VA during operation, approximately 350 VA during warm-up phase
EMC (Electromagnetic Compatibility)	In accordance with standard requirements of NAMUR NE21 (08/98)
Electrical safety	According ... EN 61010-1, overvoltage category II
Fuse values	100 ... 120 V: 4.0 T/250 200 ... 240 V: 2.5 T/250

Gas inlet conditions

Permissible sample gas pressure	
• Without pump	< 2000 hPa abs.
• With integrated pump	600 ... 1100 hPa
Sample gas flow	18 ... 60 l/h (0.3 ... 1 l/min)
Sample gas temperature	0 ... 200 °C
Sample gas humidity	< 90% RH (RH: relative humidity)

Dynamic response

Warm-up period	At room temperature, approximately 2 ... 3 h
Display delay (T ₉₀)	2 ... 3 s
Damping (electrical time constant)	0 ... 100 s, parameterizable
Dead time (purging time of the gas path in the unit at 1 l/min)	With filter, 2 ... 3 s
Time for device-internal signal processing	< 1 s

Measuring response

(relating to sample gas pressure 1013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Output signal fluctuation	< 0.75% of the smallest possible measuring range according to rating plate, with electronic damping constant of 1 s (corresponds to ± 0.25% at 2 σ)
Zero point drift	< 0.5%/month of the smallest possible measuring span according to rating plate
Measured value drift	< 1%/week of the current measuring range
Repeat precision	< 1% of the current measuring range
Minimum detectable quantity	0.1 ppm (version for ultra-pure gas measurement: 50 ppb)
Linearity error	< 1% of the current measuring range

Influencing variables

(relating to sample gas pressure 1013 hPa absolute, 0.5 l/min sample gas flow and 25 °C ambient temperature)

Ambient temperature	< 1%/10 K relating to the smallest possible measuring span according to rating plate
Atmospheric pressure	< 1%/50 hPa
Sample gas pressure	< 2% of the current measuring range/1% pressure change (within 600 ... 1100 hPa)
Auxiliary power	< 1% of the current measuring range with rated voltage ± 10%
Position influence	< 1% with < 15° inclination

Electrical inputs and outputs

Analog output	0/2/4 ... 20 mA, potential-free; load max. 750 Ω
Relay outputs	6, with changeover contacts, freely parameterizable, e.g. for measuring range identification; loading capacity: 24 V AC/DC/1 A, potential-free
Analog inputs	2, dimensioned for 0/2/4 ... 20 mA for external pressure sensor and residual gas influence correction (correction of gas interference)
Binary inputs	6, designed for 24 V, potential-free, freely parameterizable, e.g. for measurement range change-over
Serial interface	RS 485
Options	AUTOCAL function each with 8 additional binary inputs and relay outputs, also with PROFIBUS PA or PROFIBUS DP

Climatic conditions

Permissible ambient temperature	5 ... +45 °C during operation, -30 ... +70 °C during storage and transportation
Permissible humidity	< 90% RH (RH: relative humidity) within average annual value, during storage and transportation (dew point must not be undershot)

Continuous Gas Analyzers, extractive

FIDAMAT 6

19" unit

FIDAMAT 6 with pump and heated oven, with combustion air connection

Gases	Input pressure	Operating pressure		Flow through FID	Flow through bypass
		Pump startup			
		Without	With		
	hPa (abs.)	hPa (abs.)	hPa (abs.)	ml/min	ml/min
Combustion gas	3000 ... 5000	2000 ± 20		~ 25	—
Combustion air	3000 ... 5000	1420 ± 20	1500	~ 320	~ 500
Sample gas	~ 1000	—	1500 ± 2	~ 3	~ 1000
Zero gas	3500 ... 4000	—	1500 ± 2	~ 3	~ 1000
Calibration gas	3500 ... 4000	—	1500 ± 2	~ 3	~ 1000

FIDAMAT 6 without pump, with heated oven, with combustion air connection

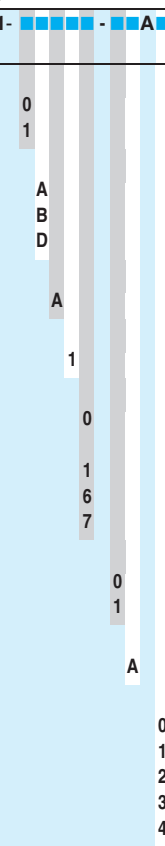
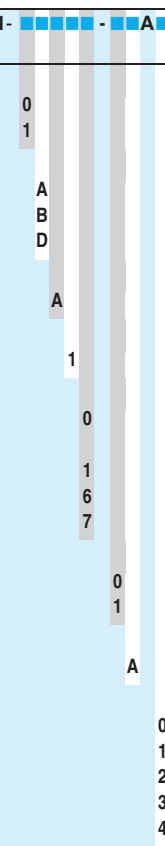
Gases	Input pressure	Operating pressure		Flow through FID	Flow through bypass
		Sample/calibration gas			
		Without	With		
	hPa (abs.)	hPa (abs.)	hPa (abs.)	ml/min	ml/min
Combustion gas	3000 ... 5000	2000 ± 20		~ 25	—
Combustion air	3000 ... 5000	1485 ± 5	—	~ 320	~ 300
Sample gas	~ 2000	—	1500 ± 2	~ 3	~ 500
Zero gas	~ 2000	—	1500 ± 2	~ 3	~ 500
Calibration gas	~ 2000	—	1500 ± 2	~ 3	~ 500

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Continuous Gas Analyzers, extractive FIDAMAT 6

19" unit

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Selection and Ordering Data	Order No.
FIDAMAT 6 gas analyzer 19" unit for installation in cabinets	D) 7MB2421-  -  A
Gas connections Pipe with 6 mm outer diameter Pipe with 1/4" outer diameter	
Version Without pump, for sample gas with overpressure ¹⁾ Without pump, for sample gas with overpressure; ultra-pure gas measurement ¹⁾ With heated pump, for sample gas with atm. pressure	
Combustion air feed With connection for combustion air	
Channel number 1-channel version	
Supplementary electronics Without AUTOCAL function • With 8 additional binary inputs/outputs • With 8 binary inputs/outputs, PROFIBUS PA interface ¹⁾ • With 8 binary inputs/outputs, PROFIBUS DP interface ¹⁾	
Auxiliary power 100 ... 120 V AC, 48 ... 63 Hz 200 ... 240 V AC, 48 ... 63 Hz	
Combustion gases H ₂	
Language (supplied documentation, software) German English French Spanish Italian	
Further versions	Order code
Add "-Z" to Order No. and specify order code	
Telescopic rails (2 units)	A31
Set of Torx screwdrivers, Allen screwdrivers	A32
TAG labels (specific inscription based on customer information)	B03
Clean for O ₂ service (specially cleaned gas path) ¹⁾	Y02
Measuring range indication in plain text, if deviating from standard setting	Y11
Special setting (only in conjunction with an appl. no.)	Y12
Extended special setting (only in conjunction with an appl. no.)	Y13
TÜV version acc. to 17. BImSch ²⁾	Y17
Retrofitting sets	Order No.
RS 485/Ethernet converter	A5E00852383
RS 485/RS 232 converter	D) C79451-Z1589-U1
RS 485/USB converter	A5E00852382
AUTOCAL function each with 8 binary inputs/outputs	D) C79451-A3480-D511
AUTOCAL function 8 binary inputs/outputs each and PROFIBUS PA	D) A5E00057307
AUTOCAL function 8 binary inputs/outputs each and PROFIBUS DP	D) A5E00057312

¹⁾ On request²⁾ Available soon

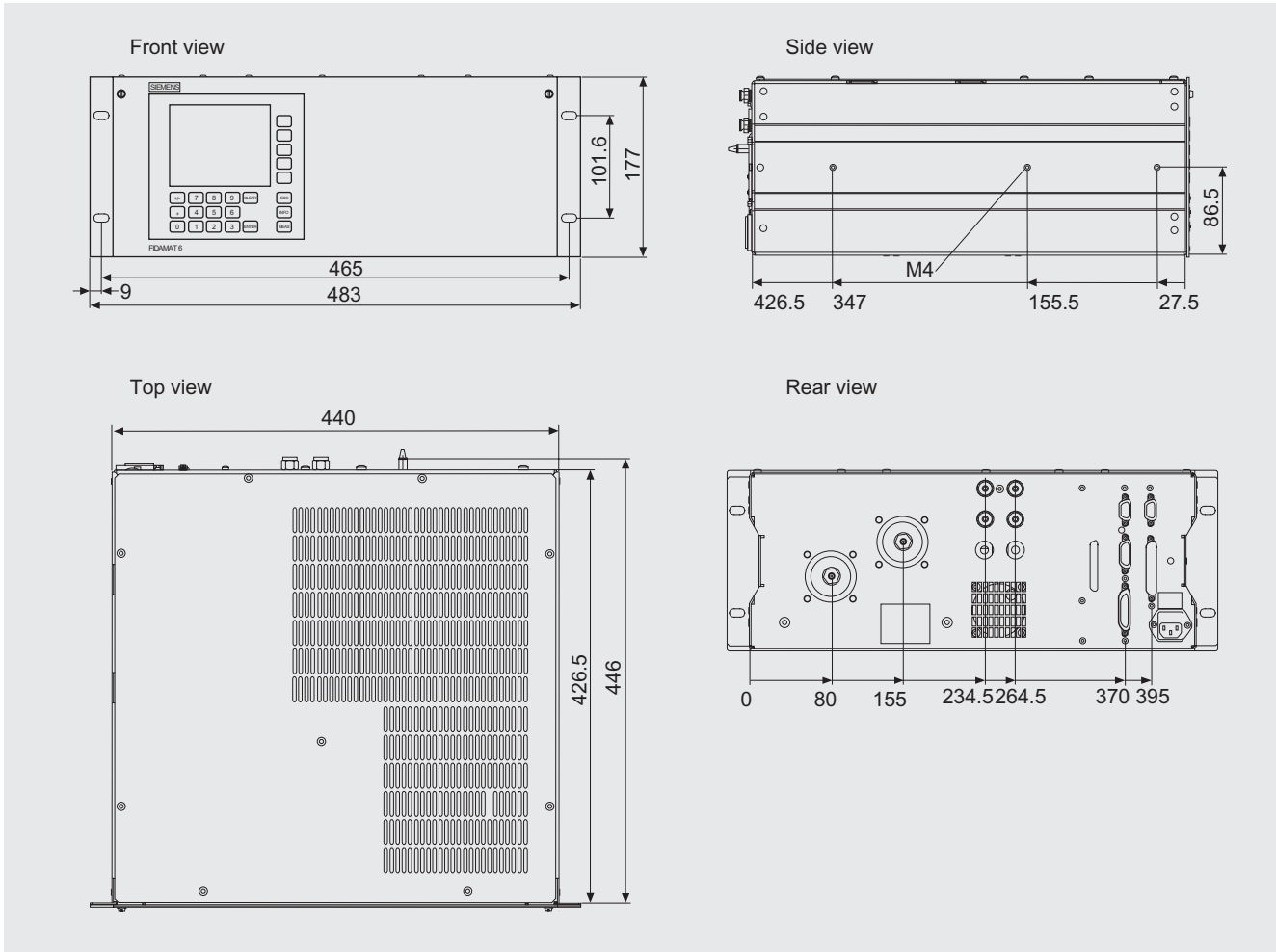
D) Subject to AL export regulations: 91999, ECCN: N

Continuous Gas Analyzers, extractive FIDAMAT 6

19" unit

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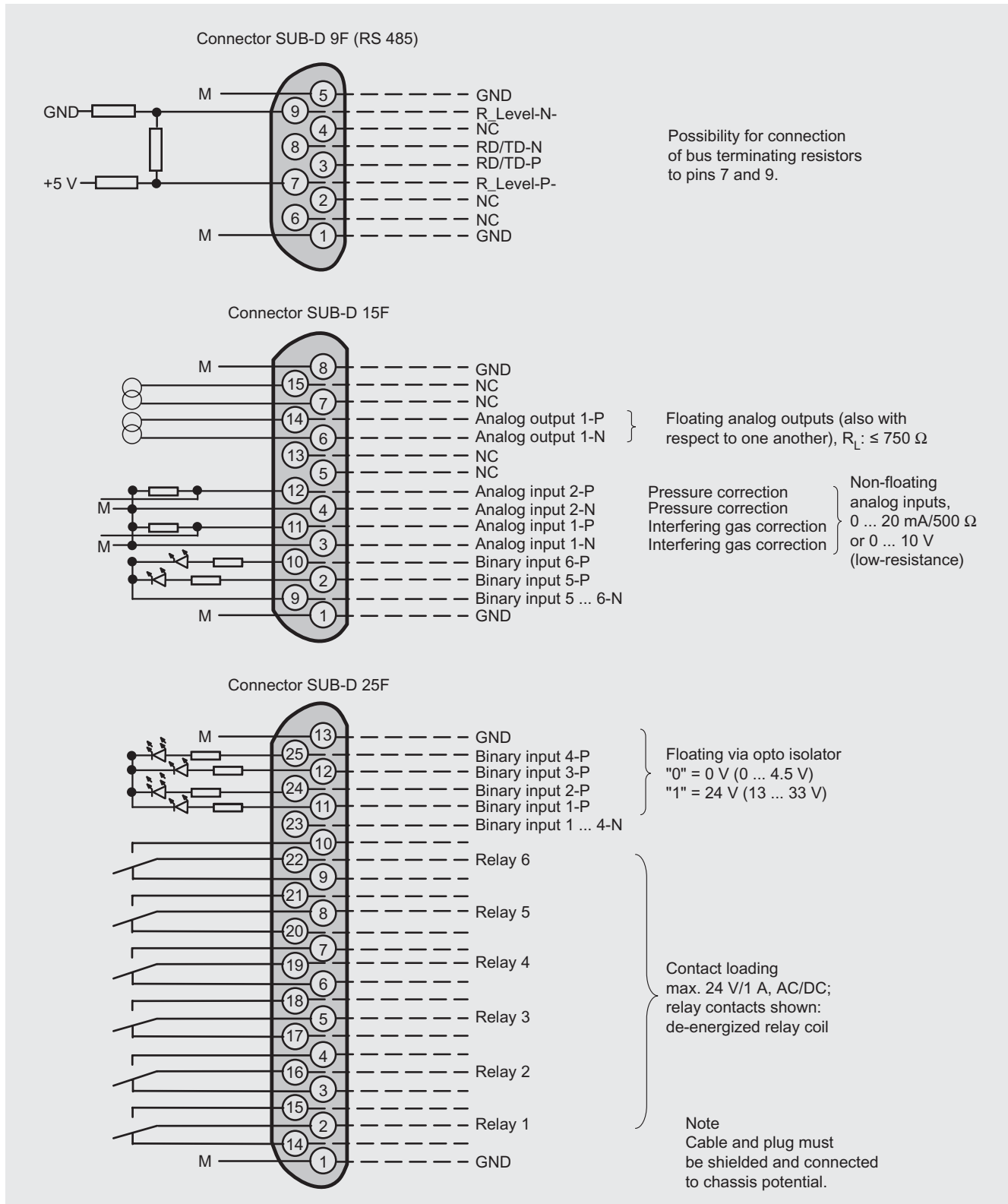
Dimensional drawings



FIDAMAT 6, 19" unit, dimensions in mm

Schematics

Pin assignment (electrical and gas connections)

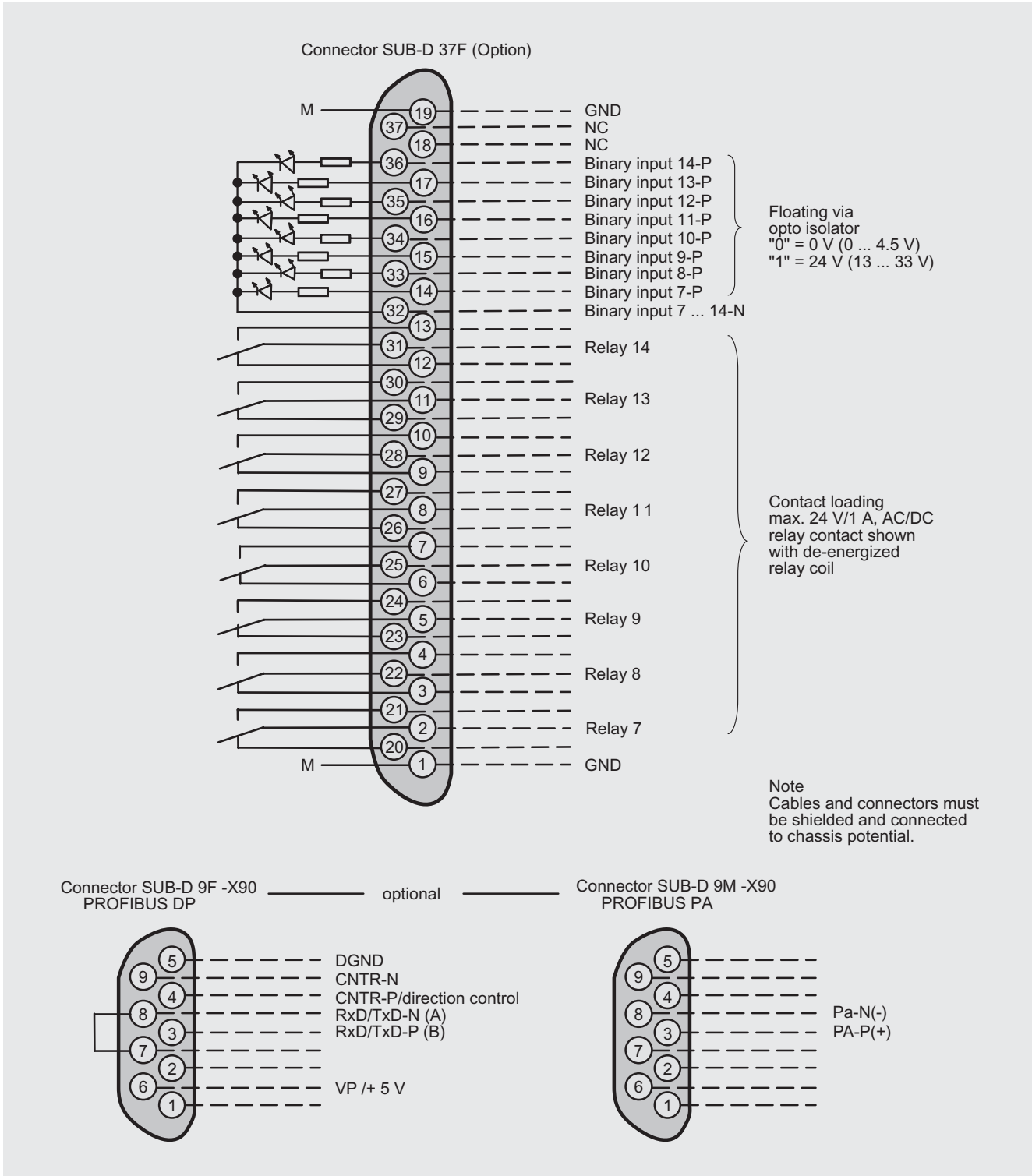


FIDAMAT 6, 19" unit, pin assignment

Continuous Gas Analyzers, extractive FIDAMAT 6

19" unit

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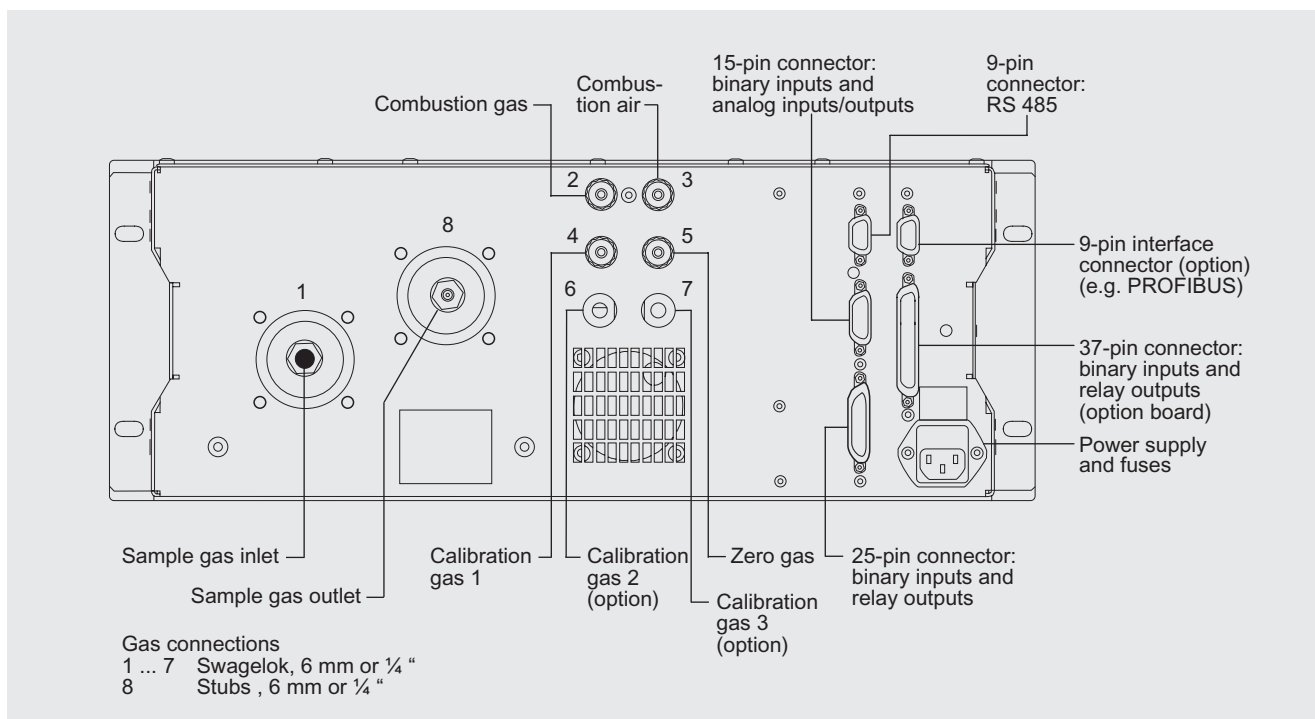


FIDAMAT 6, 19" unit, pin assignment of the AUTOCAL board and PROFIBUS connectors

Continuous Gas Analyzers, extractive FIDAMAT 6

19" unit

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FIDAMAT 6, gas and electrical connections, version with pump

Documentation

Selection and Ordering Data

Manual	Order No.
FIDAMAT 6 Gasanalysengerät zur Bestimmung von Gesamtkohlenwasserstoff (German)	D) A5E00221703
FIDAMAT 6 Gas Analyzer for the Determination of Total Hydrocarbon Content (English)	D) A5E00222135
FIDAMAT 6 Analyseur de gaz pour la détermination des hydrocarbures totaux (French)	D) A5E00222138

Manual	Order No.
FIDAMAT 6 Analizador de gases para la determinación del contenido total de hidrocarburos (Spanish)	D) A5E00222141
FIDAMAT 6 Apparecchio analisi del gas per la determinazione della quantità di idrocarburi totali (Italian)	D) A5E00222144

D) Subject to AL export regulations: 91999, ECCN: N

Continuous Gas Analyzers, extractive FIDAMAT 6

Proposition of spare parts

Selection and Ordering Data

Description	Order No. FIDAMAT 6			
	2 years (qty)	5 years (qty)	With pump	Without pump
Analyzer part				
FID oven insert	1	1	D) A5E00248859	A5E00429784
FI detector, complete		1	D) A5E00295816	D) A5E00295816
Sample gas path				
Pump	1	1	D) A5E00248837	
Filter, with gasket for sample gas	1	3	D) A5E00248845	D) A5E00248845
Pressure regulator	1	1	D) A5E00248851	D) A5E00248851
Gasket for pressure regulator	1	2	D) A5E00295107	
Filter, complete (sample gas inlet, 6 mm)		1	D) A5E00295928	
Filter, complete (sample gas inlet, 1/4")		1	D) A5E00295976	D) A5E00295976
Solenoid valve (1-way)	1	2	D) A5E00296562	
Solenoid valve (2-way)	1	2	D) A5E00296565	D) A5E00296565
Gasket, PTFE, 1.5 mm (20 units)	1	2	D) C79451-A3040-D101	D) C79451-A3040-D101
Gasket, graphite, 0.5 ... 1 mm (20 units)	1	2	D) C79451-A3040-D102	D) C79451-A3040-D102
Gasket, graphite, 1.5 mm (20 units)	1	2	D) C79451-A3040-D103	D) C79451-A3040-D103
Gasket, graphite, 3 mm (20 units)	1	2	D) C79451-A3040-D105	D) C79451-A3040-D105
Pressure ring, 1 mm (20 units)		1	D) C79451-A3040-D112	D) C79451-A3040-D112
Pressure ring, 1.5 mm (20 units)		1	D) C79451-A3040-D113	D) C79451-A3040-D113
Outer rings, 0.5 ... 1 mm (20 units)		1	D) C79451-A3040-D121	D) C79451-A3040-D121
Outer rings, 1.5 ... 3 mm (1/8 inch) (20 units)		1	D) C79451-A3040-D122	D) C79451-A3040-D122
Electronics				
Front plate	1	1	D) A5E00248790	A5E00248790
Adapter board	1	1	D) A5E00248795	A5E00248795
Temperature fuse	1	2	D) A5E00248802	A5E00248802
Fusible plug, 230 V AC	2	3	D) A5E00248819	A5E00248819
Fusible plug, 110 V AC	2	3	D) A5E00248822	A5E00248822
LC display	1	1	D) A5E00248920	A5E00248920
Cable, temperature sensor oven		1	D) A5E00283770	A5E00283770
Cable, temperature sensor physics		1	D) A5E00283780	A5E00283780
Cable, magnetic distributor		1	D) A5E00283800	A5E00283800
Cable, heating oven, 230 V AC		1	D) A5E00283817	A5E00283817
Cable, heating oven, 110 V AC		1	D) A5E00295469	A5E00295469
Cable, tensile stress, complete		1	D) A5E00284092	A5E00284092
Cable, measuring cable		1	D) A5E00284094	A5E00284094
Cable, connecting cable (4-pole)	1	1	D) A5E00284095	A5E00284095
Cable, connecting cable (5-pole)	1	1	D) A5E00284096	A5E00284096
Axial-flow fan, 24 V DC		1	D) A5E00313839	D) A5E00313839

D) Subject to AL export regulations: 91999, ECCN: N

If the device was supplied with a specially cleaned gas path for high oxygen context ("Cleaned for O₂ service"), please ensure that you specify this when ordering spare parts. This is the only way to guarantee that the gas path will continue to comply with the special requirements for this version.