

**AMA Instruments GmbH**

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## Monitoring of organic compounds

### Online gas chromatograph – GC 4000

#### **Best value for price for industrial monitoring applications**

The GC 4000 online gas chromatograph is always the first choice if just a single component or only a few components have to be monitored. The analyzer has especially been developed for industrial applications such as continuous monitoring of solvents, halogenated or aromatic hydrocarbons or other organic components in air and gas streams.

The rugged design of the GC 4000 provides reliable operation in unattended operation mode. The isothermal air-bath oven allows installing various analytical columns for a wide range of applications. Acquisition of chromatograms at constant temperature typically allows for extremely short measuring cycles. The GC 4000 can be supplied either with a photo ionization detector (PID) or a flame ionization detector. Optionally a stripping column device is optionally available in order to retain and backflush high boiling compounds.

Various system modules complement the GC 4000 providing complete monitoring solutions. Any module features its own intelligent control electronics and allows for data transfer to the analyzer via internal bus communications. Thus each monitoring system can be configured according to the specific requirements covering a wide range of industrial and process monitoring applications.

### **Powerful control software**

The GC 4000 features powerful analyzer control software with integrated 32-bit data chromatography system. The intuitive user interface allows for easy operation and setup of the analyzer. Furthermore the software has proven to run extremely stable in unattended operation mode.

The analyzer software allows controlling and observing the instrument remotely via Ethernet or modem communications. All data and status messages can be transmitted via analog and digital I/O's or serial communications using common standard protocols.

A display and control panel will optionally be available and allows for intuitive touch screen operation providing direct access to all maintenance and diagnostic functions. All parameters and analytical methods can be edited in a convenient manner. The actual operating status of the analyzer as well as chromatograms and results will be displayed on the color screen.

### **Extensive safety features**

All system parameters of the GC 4000 will be observed continuously. Any deviation from normal operation will be recorded and stored into a log file. In case of serious malfunctions or instrument failures an error message will be transmitted immediately. Therefore the gas chromatograph meets the highest demands for safe and unattended operation.

To ascertain proper analyzer operation, each controller as well as the operating system and the software will continuously be observed. In case of a system crash the computer will automatically reboot and the gas chromatograph starts in a self-acting manner the next analysis cycle.

### **Range of applications**

- Determination of solvents in air and gas streams
- Monitoring of waste air in drying and distillation plants
- Determination of halogenated hydrocarbons such as vinyl chloride, methylene chloride, CFC's and others
- Monitoring of aromatic hydrocarbons (benzene, toluene, etc.)
- Determination of volatile organic compounds (VOC)
- Monitoring of industrial processes and plants
- Monitoring of waste gas treatment installations
- etc.

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## TECHNICAL DATA

### General

Enclosure	19" plug-in case
Height	6 height units
Depth	400 mm
Weight	appr. 24 kg
Mounting	designed for cabinet/rack mounting, telescopic slide mounting recommended
Ambient temperature	0°C to 40°C
Humidity	5% to 95% relative humidity, non-condensing
EMC	CE-marking, conformity with EMC-guideline 89/336/EEC

### Instrument supply

Power supply	220 - 250 VAC, 110 -120 VAC (optional)
Line frequency	50 - 60 Hz
Power consumption	max. 500 W
Carrier gas	N <sub>2</sub> , GC Grade, min. 3 bar
Supply gases	Combustion air, GC Grade, min. 3 bar (for FID only) H <sub>2</sub> , GC Grade, min. 3 bar (for FID only)
Supply connections	1/8" bulkhead union
Pressure control	Integrated pressure regulators, electronic readout of carrier gas pressure, manometers for indication of supply pressures (for FID only)

### Sampling

Sampling	Low-maintenance membrane pump for automated sampling
Sampling control	Electronic monitoring of sample gas line during sampling
Sample volume	Sample loop – 20 to 2000 µl

### Valve and column oven

Oven liner	Stainless steel
Internal dimensions	H 245 mm x W 210 mm x D 55 mm
Sample valve	6-Port VALCO valve, electrically actuated
Stripping column	Optionally available – depending on application
Analytical column	Packed or capillary column – depending on application
Heating	Forced air
Temperature range	40 °C to 120 °C, isothermal operation
Temperature control	Closed loop PID, setpoint resolution 1 °C

### Detector (select one type)

FID	FID – Flame Ionization Detector <ul style="list-style-type: none"><li>• Stable signal output due to temperature controlled detector block</li><li>• Make-up gas connection provides enhanced detection sensitivity</li><li>• Linearity of the FID &gt; 10<sup>7</sup></li><li>• Amplifier output 0-5 VDC</li><li>• Requires H<sub>2</sub> and combustion air supply</li></ul>
PID	PID – Photo Ionization Detector <ul style="list-style-type: none"><li>• Electrode-less, radio frequency excited UV lamp provides increased UV intensity and extended lifetime of lamp</li><li>• Stable signal output due to temperature controlled detector block</li><li>• Amplifier output 0-5 VDC</li></ul>

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**Communication**

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Communication ports	2 x Ethernet, RS232, RS485, 4 x USB, PS2, VGA
I/O-modules	Various I/O modules optionally available providing <ul style="list-style-type: none"><li>• programmable analog outputs, 4-20 mA / 0-5 V / 0-10 V</li><li>• digital outputs for analyzer status messages, errors, alarms, sample line allocation, etc.</li><li>• digital inputs for remote control of analyzer</li></ul>

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**Options**

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- Display and control panel with intuitive touch-screen operation
  - Various I/O modules with 4 or 8 analog outputs (4-20 mA / 0-5 V / 0-10 V) and digital I/O's
  - Calibration gas selector (sample, cal1, cal2)
  - Stripping column device for retention and back flushing of high boiling organic compounds and/or humidity
  - Combustion air supply for FID (dry-running compressor with exchangeable charcoal filter)

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