

Product Data Sheet

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BINOS[®] 100 2M

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APPLICATIONS

- Flue gas analysis of boilers & power plants
- Monitoring fermentation processes in biotechnology
- Detection of Threshold Limit Values (TLV; workers protection) in workplaces and food stocks
- Air monitoring in greenhouses for the optimization of plant growth and ripening
- Internal combustion engine emissions
- Oxygen monitoring for burner efficiency control
- Metallurgical hardening & process gas
- Safety measurement in flammable mixture
- Quality control at natural gas and distribution
- Measuring of photosynthesis

FEATURES

- Internal or external universal power supply
- Rugged design (1/2 19") for mobile and stationary use
- Combination of infrared sensors, thermal conductivity, electrochemical oxygen and paramagnetic oxygen sensors
- User friendly front panel and keypad
- Adjustable analog voltage and current outputs, optically isolated
- Digital outputs for selectable concentration alarms and valve control
- Digital inputs for remote valve control, pump control and autocalibration.
- Microprocessor controlled analyzer, continuously monitoring the device functions



- Serial interface for data transfer and remote analyzer control
- Selfdiagnostics with alarm display and relay contacts
- Integrated sample handling system
- Autocalibration via internal valve block or external valves
- DMT suitability tested for CH₄, CO₂, CO as well as paramagnetic and electrochemical Oxygen measurement
- TÜV suitability tested for CO acc. to TI Air and 13th BImSchV as well as paramagnetic and electrochemical Oxygen measurement acc. TI Air, 13th BImSchV and 17th BImSchV
- PlantWeb Fieldbus communication, compatible to DeltaV

ROSEMOUNT[®]
Analytical

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EMERSON[™]
Process Management

DESCRIPTION

The BINOS® 100 2M as a member of the BINOS® 100 gas analyzer series offers the opportunity to combine one IR sensor with another IR sensor, a thermo-conductivity detector, an electrochemical or paramagnetic Oxygen sensor in only a 1/2 19" housing. Moreover it is possible to combine 2 paramagnetic Oxygen sensors, 1 Oxygen sensor with a thermoconductivity detector or 2 thermoconductivity detectors.

TC measurement allows the cross interference compensation for up to three externally measured gases via analog inputs.

Internal sample handling options include sample gas pump, fine-dust filter with a throttle, flow indicator and autocalibration solenoid valve block.

As all BINOS® 100 analyzers the BINOS® 100 2M has the option to include a serial interface for data transfer and external control of internal functions and relays for

NAMUR compliant status signals and pump control. A special option for process management is the fieldbus interface, compatible with DeltaV (alternative to RS interface).

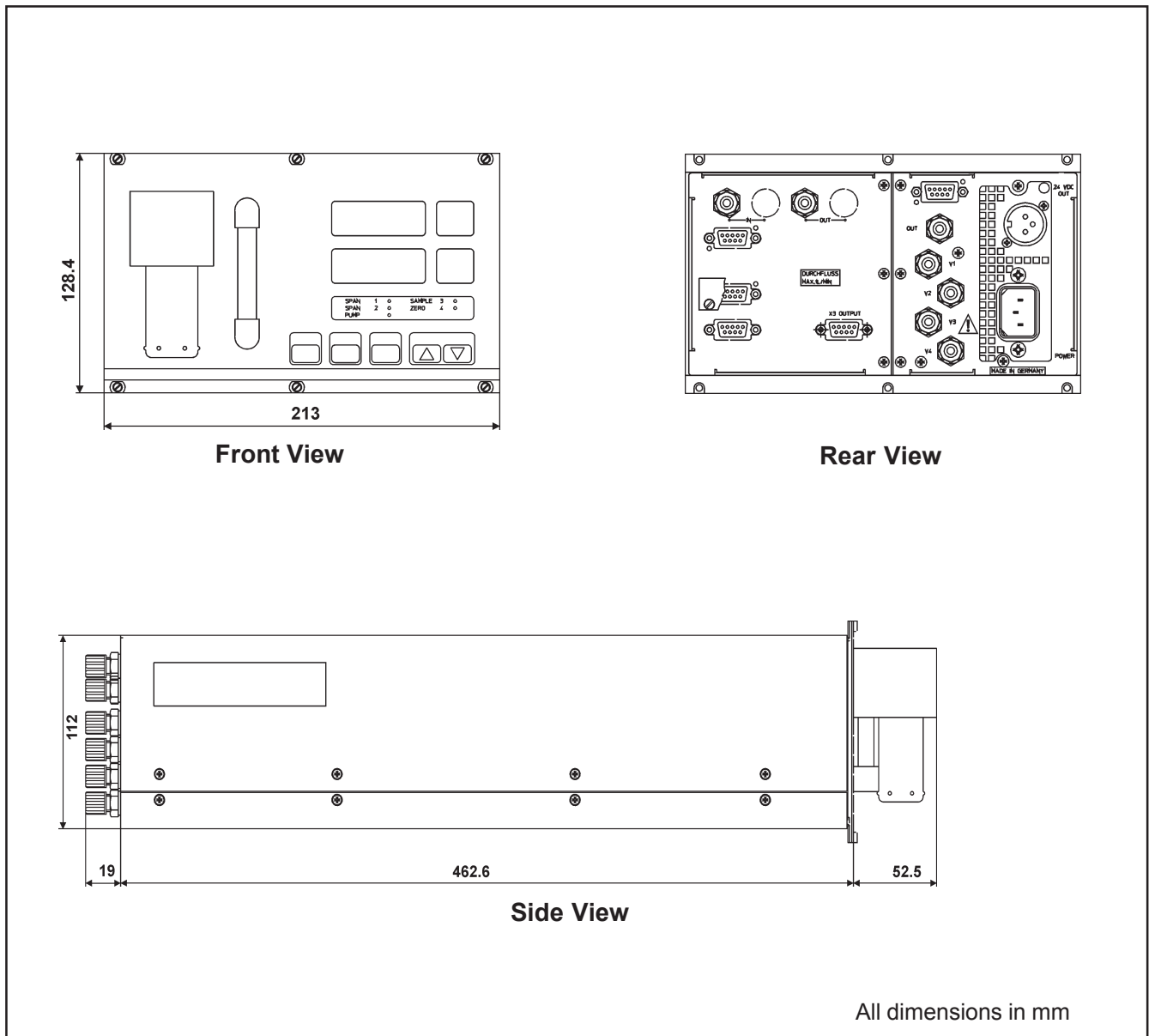
Dependent on built-in measurement systems and options (internal power consumption) the analyzer may supply external equipment with 24 V DC.

In summary the BINOS® 100 2M can be enlarged to a one or two channel gas analysis system, suitable for mobile and stationary use on account of the compact design and integrated universal power supply.

Other options include

- process cells
- SS tubing for certain process applications
- solvent resistant, corrosion resistant PO2 cells
- intrinsically safe PO2 cell for flammable gases
- barometric pressure compensation
- 7 digital inputs for remote valve control, pump control and autocalibration.

Fig. 1: Dimensions



STANDARD CONFIGURATION PARAMETERS *)

Gas Component		Minimum Ranges	Maximum Ranges
Argon	Ar	0 - 50 %	0 - 100 %
Carbon dioxide	CO ₂	0 - 100 ppm	0 - 100 %
Carbon monoxide	CO	0 - 200 ppm	0 - 100 %
Ethylene	C ₂ H ₄	0 - 400 ppm	0 - 100 %
Helium	He	0 - 10 %	0 - 100 %
Hexane	C ₆ H ₁₄	0 - 500 ppm	0 - 9,000 ppm
Hydrogen	H ₂	0 - 5 % (2 % ***)	0 - 100 %
Methane	CH ₄	0 - 2 %	0 - 100 %
n - Butane	C ₄ H ₁₀	0 - 800 ppm	0 - 100 %
Oxygen	O ₂	0 - 1 % ****)	0 - 100 % ****)
Propylene	C ₃ H ₆	0 - 4,000 ppm	0 - 100 %
Propane	C ₃ H ₈	0 - 1,000 ppm	0 - 100 %
Toluene	C ₇ H ₈	0 - 5,000 ppm	0 - 1,2 %
Water vapor **)	H ₂ O	0 - 1 %	0 - 3 %

*) Other components and configurations on request

**) Dew point must not exceed ambient temperature

***) Non-standard specifications

****) PO₂-sensor only; EO₂ up to 25 %, higher concentrations reduce sensor life-time

ELECTRICAL SPECIFICATIONS

Internal Power Supply

Input Nominal Voltage Input Voltage Range Input Current Output Output Voltage Output Current	IEC appliance inlet 110–120 / 210–240 V AC, 50/60 Hz 93–132 V AC and 196–264 V AC autoranging, 47–63 Hz max. 2,5 / 1,5 A 3 pole XLR flange (female) 24 V DC +- 5 % Depending on internal measuring channels, methods and built-in options, see table for some comparative values.	
Analyzer configuration	Internal power consumption	Max. available power (24 V DC external)
2 NDIR channels or 1 NDIR channel plus 1 electrochemical O ₂ sensor	< 60 W	< 60 W
1 NDIR channel plus 1 paramagnetic O ₂ sensor	< 90 W	< 30 W

External Power Supply

Analyzer Input Appliance Analyzer Input Voltage Analyzer Power Consumption	3 pole XLR flange (male) 24 V DC +- 5 % max. 120 W, depending on configuration
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GENERAL SPECIFICATIONS (Values refer to the lowest ranges. Standard ranges with better specs.)




	NDIR	Oxygen Sensor (PO ₂ and EO ₂)	Thermal Conductivity
Detection limit	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}	≤ 2 % ^{1) 4)}
Linearity	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}
Zero-point drift	≤ 2 % per week ^{1) 4)}	≤ 2 % per week ^{1) 4)}	≤ 2 % per week ^{1) 4)}
Span (sensitivity) drift	≤ 1 % per week ^{1) 4)}	≤ 1 % per week ^{1) 4)}	≤ 1 % per week ^{1) 4)}
Repeatability	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4)}
Total response time (t₉₀)	< 5 s ^{3) 5)}	< 5 s ^{3) 6)} / Approx. 12 s ^{3) 9)}	3 s ≤ t ₉₀ ≤ 20 s ^{3) 7)}
Permissible gas flow	0.2 - 1.5 l/min	0.2 - 1.0 l/min ⁶⁾ / 0.2 - 1.5 l/min ⁹⁾	0.2 - 1.0 l/min (± 0.1 l/min)
Influence of gas flow	-	≤ 1 % ^{1) 4)}	≤ 1 % ^{1) 4) 13)}
Max. pressure	≤ 1,500 hPa abs.	Atm. pres. ⁶⁾ / ≤ 1,500 hPa abs. ⁹⁾	≤ 1,500 hPa abs.
Influence of pressure (At constant temperature)	≤ 0.10 % per hPa ²⁾ (≤ 0.15 % / hPa at CO ₂) ²⁾	≤ 0.10 % per hPa ²⁾	≤ 0.10 % per hPa ²⁾
- With pressure compensation ⁸⁾	≤ 0.01 % per hPa ²⁾ (≤ 0.015 % / hPa at CO ₂) ²⁾	≤ 0.01 % per hPa ²⁾	≤ 0.01 % per hPa ²⁾
Permissible ambient temperature	+ 5 °C to + 40 °C ¹⁰⁾	+ 5 °C to + 40 °C ¹⁰⁾	+ 5 °C to + 40 °C ¹⁰⁾
Influence of temperature (at constant pressure)			
- On zero point	≤ 1 % per 10 K ¹⁾	≤ 1 % per 10 K ¹⁾	≤ 1 % per 10 K in 1 h ¹⁾
- On span (sensitivity)	≤ 5 % (+ 5 to + 40 °C) ^{1) 11)}	≤ 1 % per 10 K ¹⁾	≤ 2 % per 10 K in 1 h ¹⁾
Thermostat control	-	Approx. 55 °C ^{6) 12)} / None ⁹⁾	Approx. 75 °C ¹²⁾
Heating-up time	Approx. 15 to 50 minutes ⁵⁾	Approx. 50 minutes ⁶⁾	Approx. 15 minutes

- 1) Related to full scale at system parameter
END = final value set in our factory and OFS = 0
2) Related to measuring value
3) From gas analyzer inlet at 1.0 l/min gas flow
(electr. = 2 s)

- 4) Constant pressure and temperature
5) Dependent on integrated photometer bench
6) Paramagnetic oxygen measurement (PO₂)
7) dependent on measurement range
8) Pressure sensor required

- 9) Electrochemical oxygen measurement (EO₂),
not for use with sample gas containing FCHC's
10) Higher ambient temperatures (45 °C) on request
11) Starting from 20 °C (to + 5 °C or to + 40 °C)
12) Sensor / cell only
13) Gas flow constant within ± 0.1 l/min

SPECIFIC DATA

Compliances	EN 61010-1, EN 61326,    NAMUR, CSA-C/US, C-Tick GOST: VNIIMS, Pattern (Belarussia)
Suitability tests	TÜV Nord mbH (Report No. 95CU054/B), published by National Ministry of Environment July 1 st , 1992 and September 20 th , 1996: • Carbon monoxide (CO) according to TI Air, 13 th BlmSchV (Large Furnaces order) • Oxygen (O ₂) according to TI Air, 13 th BlmSchV, 17 th BlmSchV (Order on Incineration Plants for Waste and Similar Combustible Materials) DMT: (0–80 Vol.-% CO ₂ / CH ₄) IBSD/PFG-Nr. 41300392 DMT: (0–200 ppm / 10 Vol.-% CO) IBSD/PFG-Nr. 41300392 DMT: (0–10 Vol.-% O ₂) IBSD/PFG-Nr. 41300292
Protection class Weight	IP 20 acc. EN 60529 Ca. 12 kg
Options	Integrated pressure sensor and flow indicator, fine dust filter with throttle, solenoid valve block, gas sampling pump

SIGNAL IN- and OUTPUTS, INTERFACES

Analog (2, optically isolated),
off-set and end of range are freely
programmable:

- 0 - 10 V and 0 - 20 mA or
- 2 - 10 V and 4 - 20 mA
(R_B ≤ 500 Ω)
- Option: 0 (0.2) - 1 V and
0 (4) - 20 mA (R_B ≤ 500 Ω)

Digital (8, optically isolated):

- 2 threshold contacts per channel
- Valves: sample gas, zero gas,
span gas 1, span gas 2
- "Open Collector", max. 30 V DC / 30 mA

**Analog inputs for 1–3 interfering
components (TC only)**

- 0(0.2) - 1 V, 0(2) - 10 V or
- 0(4) - 20 mA

Serial interfaces (option):

- RS 232 C / 485
alternative Fieldbus (Option)

Output relays (option):

- "Measure/Calibration", "Failure
Analyzer" and "Pump on/off"
- "Floating contacts", max. 30 V / 1 A

Digital inputs (7, option):

- pump control, remote calibration / valves

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