Technical Data Sheet
Bosch Optical Gas Spectrometer (BOGS)

Produktbezeichnung:	Bosch Optical Gas Spectrometer (BOGS)
Version:	V1.1
Datum:	01.09.2025

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Performance of Gas Analysis	
Measurement principle	Raman spectroscopy
Gas samples	Due to principle[1)] all gas molecules
Measurement range	0 – 100 vol-%
Gas pressure	depending on the variant: 0.1 – 2.5 bar absolute 0.1 – 10 bar absolute 0.1 – 40 bar absolute
Exposure time	100 ms – 2 min
Gas temperature	5 – 40°C / 41 – 104°F
Volume of gas-leading components	25 ml

Housing and Electrical Data	
Installation	tabletop device for laboratory or laboratory-like environment connected to a PC[2)] provided by the user
Dimension (H x W x D)	180 mm x 445 mm x 525 mm (7.1 in x 17.5 in x 20.7 in, 19" 4RU rack unit)
Weight	approx. 14 kg (30.9 lb)
Gas connections	inlet and outlet: Swagelok (PN: SS-8M2-1) cutting ring with 8 mm (0.31 in) pipe diameter
Protection class	IP20
Power supply	external: 100 – 240 V AC, 50 – 60 Hz, max. 200 W

Measurement Data and Analysis	
Measured values	Raman spectrum, gas pressure and gas temperature
Linearity	the Raman signal is physically strictly linear to the partial gas density.
Calculated values	volume concentration (vol-%)
Detection threshold[3)]	typically ≥0.01 vol-%
Repeatability[4)]	typically ≤0.1 vol-% with factory evaluation models
Factory-calibrated[5)] evaluation models	*Hydrogen matrix* evaluation model for gas mixtures with hydrogen (H_2), nitrogen (N_2), oxygen (O_2), methane (CH_4), water vapour (H_2O)
	Natural gas matrix evaluation model for gas mixtures with methane (CH_4), ethane (C_2H_6), propane (C_3H_8), butanes (C_4H_{10}), pentanes (C_5H_{12}), n-hexane (C_6H_{14}), carbon dioxide (CO_2), nitrogen (N_2), oxygen (O_2), hydrogen (H_2)
User evaluation models	gas concentration determination by software-supported area calculation of manually selected spectral ranges in the Raman spectrum
	customized post-processing by means of manual analysis of Raman spectra
Result format	results are saved locally on the PC[2)] provided by the user as a *.csv file

Operation	
HMI	user-provided PC[2)]
Software	BOGS operating software downloaded from Bosch server and installed
Data interface	ethernet (LAN with RJ45)
Communication	MQTT connection between device and user PC

Technical Data Sheet Bosch Optical Gas Spectrometer

Operating Conditions		Notes
Ambient temperature[6)]	5 – 40°C (41 – 104°F)	avoid large temperature differences between gas and environment
Ambient air humidity[7)]	<80 %	temperature of the gas to be measured must not be below the dew point of the ambient air
Gas temperature	5 – 40°C (41 – 104°F)	
Gas humidity	<90 %	non-condensing
Gas flow rate	0 – 500 l/min	factory calibration[4)] at 0.4 l/min
Altitude	<2000 m above sea level	
Warm-up time	appr. 15 min at an ambient temperature of 25 °C to be ready to measure, 120 min for maximum measurement accuracy	
Other Types of Stress	avoid mechanical shocks, vibrations, pressure pulsations, rapid pressure changes, and in particular rapid pressure drops	

Materials in Direct Contact with the Sample Gas	
Gas pipes	stainless steel 1.4404
Optical window	sapphire (Al_2O_3)
Seals	HNBR
Pressure sensor	stainless steel 1.4435, 1.4435, HNBR
Temperature sensor	stainless steel 1.4404, HNBR

[1)] Radioactive gases, flammable gas mixtures, and gases which alter the chemical resistance of materials in contact with the medium must not be fed into the BOGS

[2)] Personal Computer (Notebook, ...) with current Windows operating system

[3)] depending on gas pressure, gas temperature, exposure time, gas mixture/matrix, and evaluation model

[4)] The specifications apply to operation of the BOGS with pure cylinder gases. When operating with process gases, different stability values may occur depending on the gas properties and gas treatment requirements.

[5)] factory calibration at ambient air and gas temperature of approx. 30 °C / 86°F, gas pressure 1150 hPa. Variations in operating parameters may cause measurement uncertainties in the volume concentration evaluation.

[6)] Operating Temperature: 5 - 40°C/ 41 – 104°F; Optimal measuring range: 15°C to 33°C / 59 – 91°F (best measurement accuracy)

[7)] At high temperatures combined with high humidity, condensation may occur. The exact limits are described in the user manual.

Manufactured by Bosch, distributed in the UK and Ireland by **analytik**.