

PO2ES-103DE Industrial Oxygen Sensor



TECHNICAL SPECIFICATIONS

MEASUREMENT

Operating Principle:	Partial pressure electrochemical cell	
Measurement Range:	0.01 ... 100 Vol.% O ₂	
Initial Output Signal:	2546 ... 4455 Digits	at dry ambient air
Response Time t ₉₀ :	< 10 s	
Signal Drift (long-term):	≤ 0.1 % / month	at ambient air
Linearity Error:	≤ ± 0.1 Vol.% O ₂ (absolute) ≤ ± 0.5 % (relative)	0.01 ... 35 Vol.% O ₂ whichever is greater
Zero Signal Offset:	≤ 0.3 Vol.% O ₂	at 100 Vol.% N ₂ applied for 5 min
Repeatability Error:	≤ ± 1 Vol.% O ₂	at 100 Vol.% O ₂ applied for 5 min
Influence of Gas Humidity:	- 0.03 % of signal per %rH	
Signal Temperature Compensation:	NTC on sensor PCB	
Cross-Sensitivity:	100 Vol.% CO 100 Vol.% CO ₂ 100 Vol.% C ₃ H ₈ 100 Vol.% H ₂ 3 000 ppm NO, bal. N ₂ 3 000 ppm Ethanol 3 000 ppm 1-Butanthiole 3 000 ppm Dimethyl disulfide 2 000 ppm H ₂ S, bal. N ₂ 1 000 ppm Benzene, bal. N ₂ 500 ppm SO ₂ , bal. N ₂	< 20 ppm O ₂ response < 20 ppm O ₂ response < 20 ppm O ₂ response < 400 ppm O ₂ response < 20 ppm O ₂ response < 100 ppm O ₂ response < 100 ppm O ₂ response < 200 ppm O ₂ response < 500 ppm O ₂ response < 20 ppm O ₂ response < 20 ppm O ₂ response

ELECTRICAL

Electrical Connector:	4-Pin Molex (digital signal output, I ² C interface)
Supply Voltage:	+ 3.3 V (verified), + 5.0 V (possible), > 5.5 V (PCB damage)
Resolution:	15 Bit used (16 bit processor, 1 bit for algebraic sign)
A/D Output Range:	± 32767 Digits
EEPROM:	24LC32A (32 Kbit, I ² C interface)

MECHANICAL

Weight:	≤ 27 g
Material in Contact with Media:	PVC, PPS, PTFE, ABS, NBR, Stainless Steel
Gas Connector:	fits for M16x1 DIN 13 or 5/8-24 UNEF

ENVIRONMENTAL

Operating Temperature Range:	0 ... 45 °C
Ambient Pressure Range:	700 ... 1250 hPa
Ambient Humidity Range:	up to 100 %rH non-condensing

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LIFETIME

Expected Operating Life:	6 years	at ambient air, depending on application
Nominal Sensor Life:	1 200 000 Vol.%h O ₂	at ambient air, depending on application

Important Note: All characteristics are based on conditions at 25 °C, 50 %rH, 1013 hPa and a gas flow of > 2.5 slpm. Digital values are based on a gain factor of 1 (A/D). For sensor performance data under other conditions, contact ITG.

STORAGE CONDITIONS IN UNOPENED ORIGINAL PACKAGE

Ambient Temperature Range:	15 ... 25 °C -20 ... 40 °C	recommended maximum one week
Ambient Pressure Range:	600 ... 1250 hPa	
Ambient Humidity Range:	50 ... 100 %rH 0 ... 30 %rH	recommended, non-condensing maximum one week

RELATED PRODUCTS

Product	Part Number	Other Specifics
O ₂ -Sensor I-103	48 03 14	RoHS compliant, lead-free, analog signal output
O ₂ -Sensor I-103D	48 15 14	RoHS compliant, lead-free, digital signal output I ² C-Address 8-bit (write/read): ADC (D0/D1)
O ₂ -Sensor I-103DE	48 15 15	RoHS compliant, lead-free, digital signal output I ² C-Address 8-bit (write/read): ADC (D2/D3), EEPROM (AA/AB), Temp.Sens. (3A/3B)
O ₂ -Sensor I-103DE 80	48 80 15	RoHS compliant, lead-free, digital signal output I ² C-Address 8-bit (write/read): ADC (D4/D5), EEPROM (AA/AB), Temp.Sens. (3A/3B)

Cleaning and Disinfection

The sensor outer housing can be cleaned with a dry wipe. Do not wipe the sensor's gas entrance side. Do not use any chemical disinfectant or sanitizer on the sensor.

Poisoning

ITG sensors are designed to operate in a wide range of environments. For optimal sensor lifetime and performance it is important that exposure to high concentrations of solvent vapours is avoided during storage, installation into instruments and operation of the sensor.

Do not use adhesives directly on or near the sensor as the solvents may cause stress corrosion on the plastic parts.

Stabilisation Time

When installing a new sensor refer to the instrument manual for stabilisation time before calibration.

If not specified otherwise wait at least 15 minutes to ensure that the sensor has stabilised in the instrument.

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Calibration Interval

ITG sensors are designed to have minimal signal drift over their functional lifetime. For optimal performance and maximum measurement accuracy however they should be calibrated before each use.

If the Sensor is dropped

If a sensor is dropped, please check for visible mechanical damage of the sensor or if the sensor is leaking electrolyte. If this is the case, do not try to install the sensor into the device. Take safety precautions and immediately dispose the cell.

If the sensor shows no visible damage it should be placed in quarantine for at least 24 hours. Afterwards a follow-up check made by a two point calibration should be done.

Installation in Device

A gas tight sealing is ensured when the sensor is screwed in hand-tight. Don't use any mechanical tools to install the sensor. Using excessive force may damage the sensor.

Optimal mounting position of the sensor is when the gas sensing area faces downwards. A horizontal position is acceptable. It is not recommended to use the sensor with the gas sensing area facing upward.

Connection should be made via recommended electrical and mechanical connectors only. The specified load resistance must be taken into account. Soldering the sensor will damage it and void the warranty. Please contact ITG for further information.

Since temperature has an influence on the output signal it is not advisable to place any heat or vibration sources (i.e. electric-pumps or valves, coolers, etc.) in close proximity to the cell.

Avoid proximity of the cell to any EMC radiating units as those emit frequencies which might interfere with the sensor's electrical connection and connecting cable.

RFI/EMI Susceptibility

ITG sensors contain metal parts and might be susceptible to RFI or EMI. Before use in MRI environments please contact ITG for further information.

Disposal

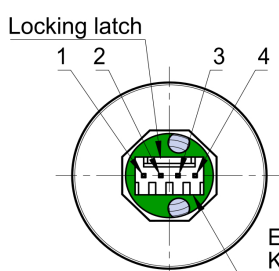
At the end of the sensors lifetime the sensor should not be disposed off in normal public waste as it may contain hazardous materials and caustic electrolyte (for more information refer to the PSDS). Please contact your local authorities for environmental legislation to relevant local waste disposal.

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TECHNICAL DRAWING

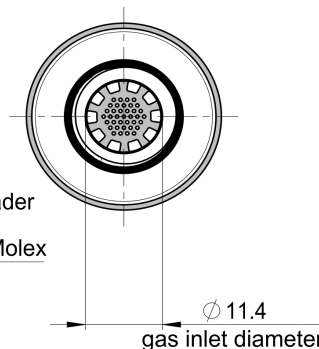
Sensor	ITG Part number	Color			Electrical pin assignment			
		Cap	Housing	Threaded ring	Pin 1	Pin 2	Pin 3	Pin 4
I-103DE	481515	white	grey	white	0V	SDA	SCL	3.3V recommended 3.3V to 5.0V possible >5.5V PCB damage

Top view

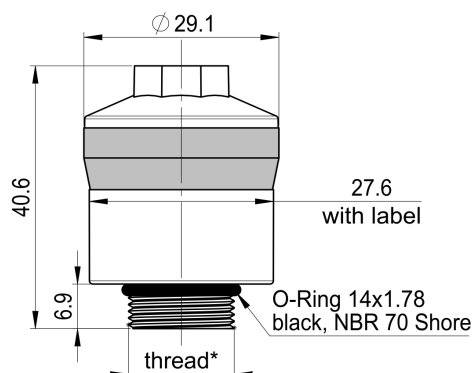


Electrical connector:
KK 254 Wire-to-board header
vertical, with friction lock
4 circuits, 2,54 mm type Molex

Bottom view



Front view



* thread is compatible with M16x1 and 5/8-24 UNEF

Dimension unit: mm

Dimension tolerances: linear ± 0.5 mm, diameter ± 0.3 mm

We are here for you. Addresses and Contacts.

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