

MADE IN GERMANY

SILAREX CO₂ / SILAREX CO₂ Plus

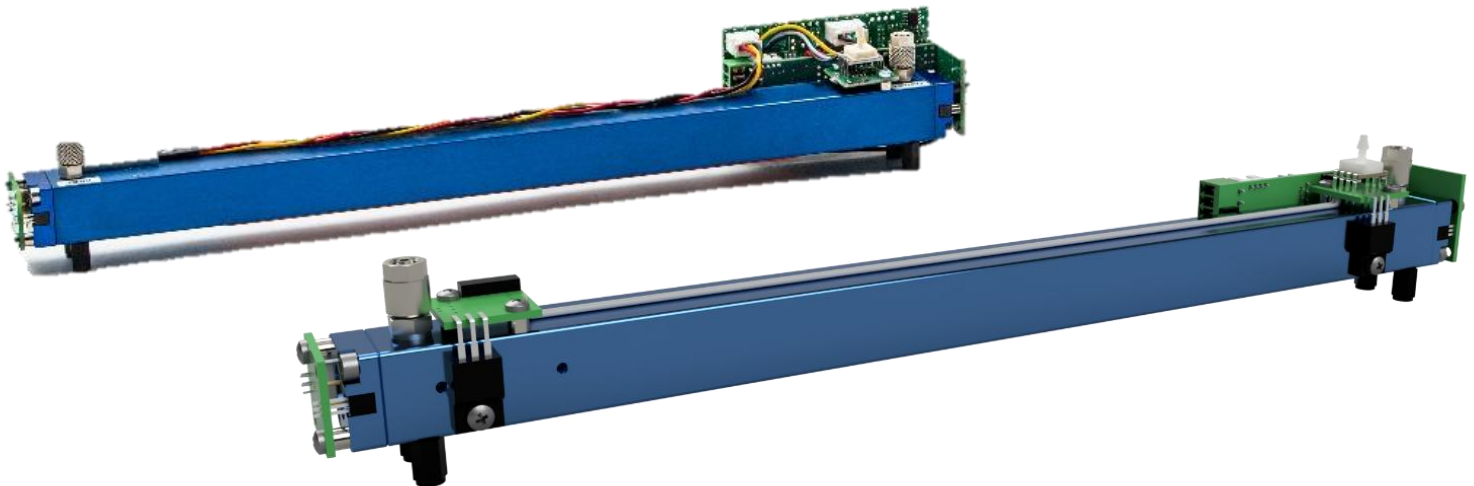
NDIR Multi-Range Sensor
CO₂ 100 ppm // CO₂ 1000 ppm // CO₂ 25000 ppm
smartGAS item number:
SILAREX SX-300012 / SILAREX Plus SP-300012-xxx

Product Features:

- 3 active measurement channels
- Ready to use calibrated
- Perfect solution for TOC (total organic carbon)
- Three Different Ranges merged into one Signal
- On board pressure compensation
- Modbus ASCII/RTU, autobaud, autoframe
- Status indicated by LED

Product Features SILAREX Plus only:

- Active Noise reduction Filter
- Low noise at lowest T90 time
- Low LDL
- High data frequency
- Wide Range Power Input
- High-end active thermal heat Controller



The **SILAREX CO₂** sensors are optimized to measure CO₂ in an extremely wide range. To reach this there are three different measuring ranges mapped in one output signal. This ensures to measure small as well as large CO₂ signal with a very low linearity error to get the best results for the TOC analysis as well as CO₂ Capturing applications and others.

Options

- Case with thermal isolation
- USB Adapter
- Different gas connections
- Calibration Software
- Data Logger software
- Calibration and Test-Gases
- Gas Cooler, Filter
- Pre-Treatment

Support

- Design-In support
- Customization:
 - Software
 - Protocols
 - Measuring ranges
 - Background gas optimizing
 - Interfaces

smartGAS Mikrosensorik GmbH

Huenderstrasse 1, 74080 Heilbronn, Germany
T +49 (0) 7131 797553-0
sales@smartgas.eu www.smartgas.eu

smartGAS Sensor Technology Co., Ltd

Building 16, No. 59 Jiangnan Rd. CEDZ Changshu, Jiangsu, China
T +86 (0) 512-83380880
info@smartgas-cn.com www.smartgas-cn.com

General features

Measurement principle: Non Dispersive Infra-Red (NDIR), quad wavelength	Channel 1:	Channel 2:	Channel 3:	Release Date 11 Jul 2025
Target gas:	CO ₂	CO ₂	CO ₂	
Measurement range:	0 ... Full Scale (FS) FS = 100 ppm	FS = 1000 ppm	FS = 25000 ppm	
Gas supply:	by flow (nearly atmospheric pressure)			
Flow rate:	0.1 ... 1.0 l / min			
Gas Cuvette Length	200mm			
Cuvette Volume	~10,05 cm ³			
Gas Connections	5/3mm Rubber Tube Fitting (default)			
Warm-up time:	< 2 minutes (start up time) < 30 minutes (full specification)			

Mounting dimensions: See also technical Drawing	SILAREX TOC CO₂ 100/1000/2500ppm I SX-300012 236 mm x 40 mm x 55 mm (L x W x H)	SILAREX Plus CO₂ 100/1000/2500ppm I SP-300012-xxx 236 mm x 51 mm x 55 mm (L x W x H)
---	--	---

Measuring response*

Response time (t ₉₀) @ 0.7 l / min **:	< 3,5 s (fast mode), < 8 s (medium mode), < 60 s (slow mode)			< 3,5 s		
Maximum Data Rate	2,5 Hz			10 Hz		
Digital resolution:	Channel 1:	Channel 2:	Channel 3:	Channel 1:	Channel 2:	Channel 3:
Detection limit (3 σ) max.:	0.01 ppm	0.1 ppm	2,5 ppm	0.01 ppm	0.1 ppm	2,5 ppm
T90 < 3,5 sec / Fast Mode	≤ 0.60 ppm	≤ 1.60 ppm	≤ 75 ppm	≤ 0.05 ppm	≤ 0.2 ppm	≤ 15 ppm
T90 < 8 sec / Medium Mode	≤ 0.30 ppm	≤ 0.80 ppm	≤ 38 ppm			
T90 < 60 sec / Slow Mode	≤ 0.15 ppm	≤ 0.40 ppm	≤ 20 ppm			
Repeatability:	≤ ± 0.4 ppm	≤ ± 3.5 ppm	≤ ± 80 ppm	≤ ± 0.4 ppm	≤ ± 3.5 ppm	≤ ± 80 ppm
Linearity error (straight line deviation):	≤ ± 2.0 ppm	≤ ± 20 ppm	≤ ± 250 ppm	≤ ± 2.0 ppm	≤ ± 20 ppm	≤ ± 250 ppm
Long term stability (zero): after 1000 h operating time	≤ ± 1.85 ppm	≤ ± 6.0 ppm	≤ ± 220 ppm	≤ ± 1.85 ppm	≤ ± 6.0 ppm	≤ ± 220 ppm
Long term stability (span): after 1000 h operating time	≤ ± 2.40 ppm	≤ ± 16 ppm	≤ ± 500 ppm	≤ ± 2.40 ppm	≤ ± 16 ppm	≤ ± 500 ppm

Influence of T, P, flow rate, other*

Temp. dependence (zero): with thermal isolation, heater on	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Temp. dependence (span): with thermal isolation, heater on	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Pressure dependence: pressure compensated, residual error in % of actual reading / hPa	≤ ± 0.02	≤ ± 0.02	≤ ± 0.02	≤ ± 0.02	≤ ± 0.02	≤ ± 0.02
Flow rate dependence per 0.1 l / min:	≤ ± 0.07 ppm	≤ ± 0.7 ppm	≤ ± 20 ppm	≤ ± 0.07 ppm	≤ ± 0.7 ppm	≤ ± 20 ppm

Electrical inputs and outputs

Supply voltage:	24 V DC ± 10 %	10-26VDC wide range, recommend 24VDC
Average power consumption	< 6 W (while heater on) // < 0.5 W (at stabilized temperature)	< 21 W (while heater on) // < 0.5 W (at stabilized temperature)
Inrush current:	< 400 mA	< 400 mA
Digital output signal	RS485 / one wire TTL, Modbus ASCII / RTU, autobaud, autoframe	RS485 / RS232 Modbus ASCII / RTU, autobaud, autoframe, Free ASCII
Calibration	Zero and Span via Modbus ASCII / RTU	

Climatic conditions

Sensor heating temperature	42°C ± 2 K (default, other on request)	45°C ± 0.5 K (default, other on request)
Operating ambient temperature ***:	appr. + 10 ... + 40 °C (thermal isolation required)	0 ... + 43°C (thermal isolation required)
Storage temperature:	-20 °C ... + 60 °C	
Air pressure:	800 ... 1150 hPa	
Ambient humidity:	0 ... 95 % rel. H. (not condensing)	

Options SILAREX Plus SP-

SP-nnnnnn-1x1	Heater	Temp. : 45 °C (Default)	SP-nnnnnn-1xx5	Cased 6/4mm tube with pump
SP-nnnnnn-1x3	Heater and Pressure Sensor	Temp. : 45 °C (Default) and cuvette pressure compensation	SP-nnnnnn-1xx6	Cased 5/3mm tube with pump
SP-nnnnnn-1xx1	Cased 6/4mm tube	For case size please refer the drawing	SP-nnnnnn-1xxxp	Pin Configuration ,p' can be Pin configuration A/B/C/D/E (only for cased version)
SP-nnnnnn-1xx2	Cased 5/3mm tube	For case size please refer the drawing	SP-nnnnnn-1xxxxm	Communication mode ,m' the selected communication mode

*Typical values related to 1013 hPa, T_a = 22 °C, flow = 0.7 l / min for dry (not condensing) and clean sample gas. Stated values exclude calibration gas tolerance.

** The shortest T90 time is defined by gas exchange time based on volume, gas flow rate and gas way structure.

*** The used thermal isolation need to ensure a sufficient cooling effect at the highest environment temperature.

All rights reserved. Any logos and/or product names are trademarks of smartGAS. The reproduction, transfer, distribution or storage of information contained in this brochure in any form without the prior written consent of smartGAS is strictly prohibited. All specifications – technical included – are subject to change without notice. Depending on the application, the target gas and the measurement range the technical data may differ. No liability is accepted for any consequential losses, injury or damage resulting from the use of this document or from any omissions or errors herein. The data is given for guidance only. It does not constitute a specification or an offer for sale.

For more information, please visit www.smartgas.eu or contact us at sales@smartgas.eu

Please consult smartGAS sales for parts specified with other temperature and measurement ranges. At first initiation and depending on application and ambient conditions recalibration is recommended. Recurring cycles of recalibration are recommended.