MADE IN GERMANY

FLOW^{EVO} / FLOW^{EVO} Plus

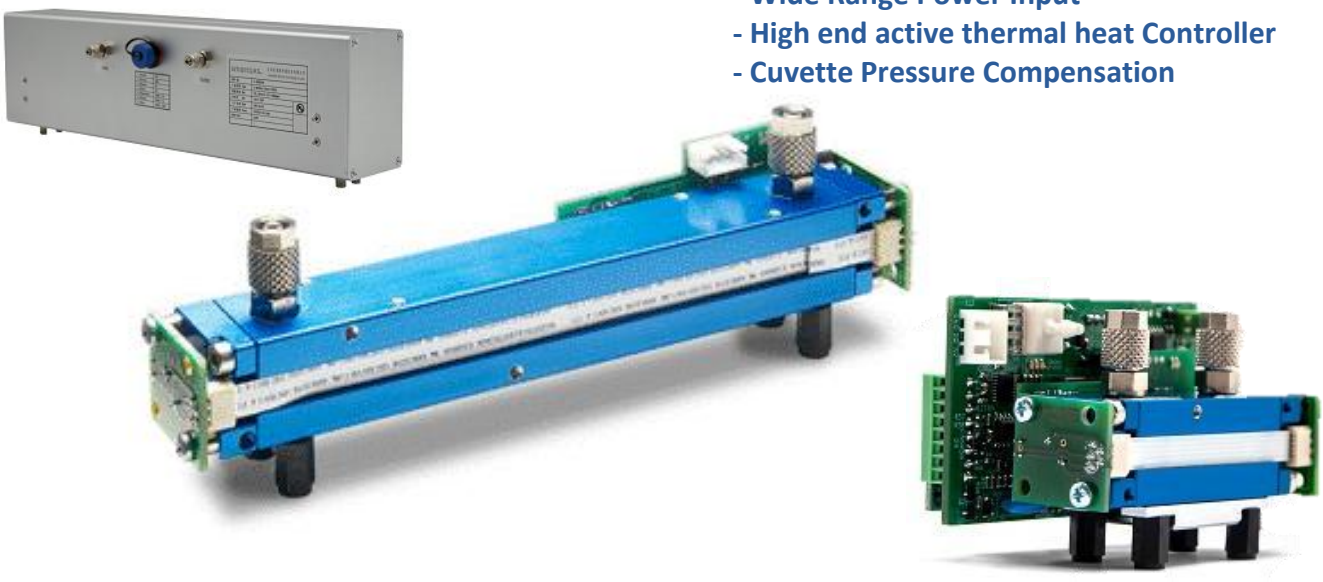
Infrared gas Sensor
Sulfur Dioxide SO_2 2000 ppm
smartGAS item number:
F3-432205 / P3-432205.xxx

Product features:

- "Ready to use" NDIR sensors
- Compact Design
- Low maintenance
- Low detection limits
- Selective against influencing gases
- Flexible interfaces
- Temperature and drift compensated
- Compact construction

Product Features FLOW^{EVO} 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
- Cuvette Pressure Compensation



The **Flow^{EVO}** sensors have a large spectrum of measurable gases and are especially convincing where it is important to have the highest precision and reliability. Different versions can be very easily combined, also facilitating complex measuring tasks. All **smartGAS** sensors are designated by low detection limits, very small drift, a large temperature range and a fast response time and markedly low operating and maintenance costs. Our NDIR sensors in the **Flow^{EVO}** series combine measuring precision with compact design and simple handling.

Optional Accessories
- Case and thermal isolation
- Heater and heat controller
- USB Adapter
- CONNECT Interface
- Calibration/Data Logger software
- Calibration and test gases
- Gas Cooler, Filter, Pre-treatment
- Analog Interfaces (EVO^{Plus})

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

smartGAS.

FLOW^{EVO} / FLOW^{EVO} Plus | Sulfur Dioxide SO_2 | F3-432205/ P3-432205.xxx

General features

Release date: 06 Nov 2024

Measurement principle:		Non Dispersive Infra-Red (NDIR), dual wavelength	
Measurement range:		0 … 2000 ppm Full Scale [FS]	
Gas supply:		by flow (nearly atmospheric pressure)	
		FLOW^{EVO} F3-	FLOW^{EVO} Plus P3-
Mounting dimensions:		156 mm x 30 mm x 50 mm (L x W x H)	156 mm x 30 mm x 55 mm (L x W x H)
Flow Rate:		0.1 … 1.0 l/min	
Gas Cuvette Length/Material		120 mm / Alloy	
Cuvette Volume		≈ 6,03 cm³	
Gas Connections		5/3mm Rubber Tube Fitting (default)	
Warm-up time:		< 2 minutes (start-up time) | < 30 minutes (full specification	

Measuring response*

Digital resolution:		0.1 ppm	
		FLOW^{EVO} F3-	FLOW^{EVO} Plus P3-
Response time (t90)	Standard	< 16 s (Standard Mode default)	< 1.6 s
0 .. 90%[FS]@0.7 l/min:	Fast Mode	< 1.6 s (Fast Mode)**	-/-
Detection limit (3 σ):	Standard	≤ 0.8 % [FS]	≤ 0,4 % [FS]
	Fast Mode	≤ 1.5 % [FS]	-/-
Repeatability:		≤ ±1 % [FS]	
Linearity error (straight line deviation):		≤ ±1 % [FS]	
Long term stability (zero):		≤ ± 2 % [FS] over 1000 h period	
Long term stability (span):		≤ ± 5 % [FS] over 1000 h period	

Influence of T,P,flow rate,other*

	FLOW^{EVO} F3-	FLOW^{EVO} Plus P3-
Temp. dependence (zero):	≤ ± 0.1 % [FS] per °C	Option: Constant heated 45 °C ±0.1 °C
Temp. dependence (span):	≤ ± 0.2 % [FS] per °C	Option: Constant heated 45 °C ±0.1 °C
Pressure dependence:	+ 0.121 % of actual reading / hPa	Option: Pressure Compensated
Flow rate dependence:	≤ ± 3 ppm per 0.1 l / min	
Cross sensitivity (zero) other gases:	≤ ± 10 ppm @ 10 Vol.-% CO2 in dry air	
Gas dew point requirement:	< + 5°C dew point (stable), particle free and clean sample gas	

Electrical parameters

	FLOW^{EVO}	FLOW^{EVO} Plus
Supply voltage:	3.3V .. 6.0 VDC	10 .. 26 VDC recommend 24VDC
Supply current (peak):	< 400mA @ 3.3V, < 240mA @ 5.0V	< 21 W (while heater on)
Inrush current:	< 600mA	< 800mA
Average power consumption:	< 800mW	< 800 mW (at stabilized temperature)
Digital output signal:	Modbus ASCII / RTU 1 Wire TTL autobaud, autoframe	RS485/RS232 Modbus ASCII / RTU autobaud, autoframe, Free ASCII
Max read out data rate	2.5 Hz	10 Hz
Calibration:	zero and span by software	

Climatic conditions

Operating temperature:	Operating : 0 .. + 50 °C | Storage : -20 .. + 60 °C
Air pressure:	800 .. 1150 hPa
Ambient humidity:	0 .. 95 % relative humidity (not condensing)

Options**** FLOW^{EVO} Plus P3-

P3-nnnnnn-1x1	Heater	Temp. : 45 °C (Default)
P3-nnnnnn-1x3	Heater and Pressure Sensor	Temp. : 45 °C (Default) and cuvette pressure compensation
P3-nnnnnn-11x	Analog Interface1	4-20mA Isolated (3kV/rms), max load 650Ω (not possible for cased version)
P3-nnnnnn-12x	Analog Interface2	0-20mA max load 600Ω | 0-2/5/10 VDC | 0.4-2/1-5/2-10 VDC min resistance load 2kΩ
P3-nnnnnn-1xx1	Cased 6/4mm tube	For case size please refer the drawing***
P3-nnnnnn-1xx2	Cased 5/3mm tube	For case size please refer the drawing***
P3-nnnnnn-1xx5	Cased 6/4mm tube with pump	
P3-nnnnnn-1xx6	Cased 5/3mm tube with pump	
P3-nnnnnn-1xxxp	Pin Configuration	‚p' can be Pin configuration A/B/C/D/E (only for cased version)
P3-nnnnnn-1xxxxm	Communication mode	‚m' the selected communication mode
P3-nnnnnn-1xxxxxc	Connected analog voltage output	‚c' connected analog Voltage output 2/5/10VDC refer to Pin configuration

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

** Adjustable only via smartGAS Calibration-Tool Software.

*** Case size may differ between version with and without pump

**** See also DS_F3_P3_Options and FLOW^{EVO} Plus Manual

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.

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