

ARVE AIR

Swiss Air Quality Management System

ARVE SENSE-Pro

Technical Specifications – Datasheet

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ARVE SENSE Pro

ARVE SENSE Pro is a smart air quality monitoring system designed to revolutionize the way we understand and manage indoor air quality. It provides accurate and real-time data on various air pollutants, helping individuals and organizations make informed decisions to create healthier living and working environments.

Product Overview

- Home Assistant integration
- Swiss air autopilot system - SAA
- High-precision, real-time air quality measurement with Swiss sensor technology
- Enterprise-level security, data encryption and management
- Fleet management optimized IoT architecture for large infrastructure deployment
- Instant data access through the state-of-the- ARVE air quality management platform and Rest API



General Specifications

Dimensions

(LxWxD) – 143.5mm x 60mm x 27.5mm

Weight

165 grams (total with USB cable and holder)

Operating Temperature

-25 °C to 70 °C

Power Consumption

1.6 Watt

Input Voltage

5 VDC, 1A (5.5mm USB power supply)

Only use ARVE SENSE Pro with the original cable and power supply provided by ARVE



Connectivity

Wi-Fi

802.11 b/g/n

Bluetooth

Bluetooth V4.2 BR/EDR and Bluetooth LE

Antennas

Built-in (2.4 Ghz Wi-Fi, Bluetooth)

Data Storage and Logging

Log Interval: 10 seconds

Data Push Interval: 10 seconds

Onboard Memory: 16 MB

Message Data Rate: 6 KB per Minute; 0.005 Mbit/s; 265 Mb per Month

ARVE-Sensors

Chemicals TVOCs

Volatile toxic chemicals can be found in many materials and cleaning products. They cause dizziness, fatigue and respiratory irritation.

Temperature

Temperature together with Humidity determine the overall comfort level in room.

Humidity

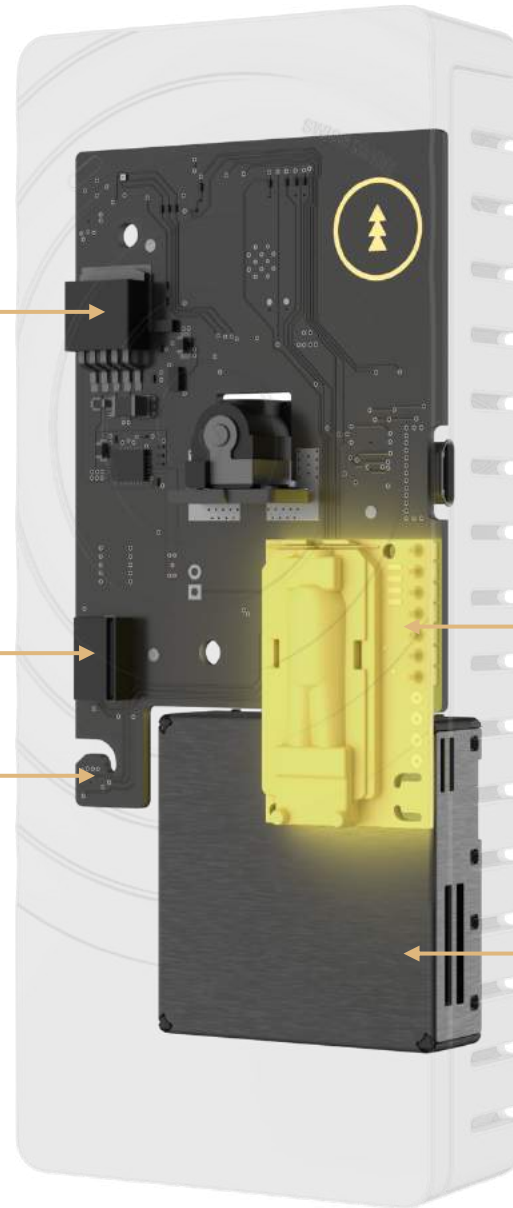
Moisture can lead to discomfort, stuffiness, bad smells and toxic mold.

CO2

Infrared based sensor indoor exposure to carbon dioxide can cause headaches, fatigue, and impact quality of sleep.

Fine Particulates

Fine particulates can travel deep into lungs and can cause asthma, increased respiratory symptoms.



PM Sensor Specifications

Particulate Matters

- Optical laser scattering sensor technology
- Unique long-term stability
- Advanced particle size binning
- Superior accuracy in mass-concentration sensing
- Fully calibrated output

Parameters	Conditions	Values
Mass concentration accuracy ¹	0 to 100 µg/m ³	±10 µg/m ³
	100 to 1'000 µg/m ³	±10 %
Mass concentration range	-	0 to 1'000 µg/m ³
Mass concentration resolution	-	1 µg/m ³
Mass concentration size range ²	PM0.5	0.3 to 1.0 µm
	PM2.5	0.3 to 2.5 µm
	PM4	0.3 to 4.0 µm
	PM10	0.3 to 10.0 µm
Number concentration range	-	0 to 3'000 /cm ³
Number concentration size range ²	PM0.5	0.3 to 0.5 µm
	PM1.0	0.3 to 1.0 µm
	PM2.5	0.3 to 2.5 µm
	PM4	0.3 to 4.0 µm
	PM10	0.3 to 10.0 µm

NOTE:

1 Deviation to TSI DustTrak™ DRX Aerosol Monitor 8533 reference. PM2.5 accuracy is verified for every sensor after calibration using a defined potassium chloride particle distribution.

2 PM_x defines particles with a size smaller than “x” micrometers (e.g., PM2.5 = particles smaller than 2.5 µm).

CO2 Sensor Specifications

Carbon Dioxide

- NDIR CO2 sensor technology
- Dual-channel detection for superior stability
- Measurement range: 400 ppm – 10'000 ppm
- Accuracy: $\pm (30 \text{ ppm} + 3\%)$
- Fully calibrated and linearized

Parameters	Conditions	Values
CO2 measurement range		0 – 40'000 ppm
Accuracy ¹	400 ppm – 10'000 ppm	$\pm (30 \text{ ppm} + 3\%MV)$
Repeatability ²	400 ppm – 10'000 ppm	$\pm 10\text{ppm}$
Response time ³	$\tau_{63\%}$	20s
Accuracy drift over lifetime ⁴	400 ppm – 10'000 ppm ASC field-calibration algorithm activated	$\pm 50\text{ppm}$

NOTE:

¹ Deviation to a high-precision reference in the calibrated range (400 – 10'000 ppm) of the sensor. Full accuracy is restored ASC recalibration features. Accuracy is based on tests with gas mixtures having a tolerance of $\pm 1.5\%$.

² RMS error of consecutive measurements at constant conditions.

³ Time for achieving 63% of a respective step function.

⁴ CO2 concentrations < 400 ppm may result in sensor drifts when ASC is activated. For proper function of ASC field-calibration algorithm sensor has to be exposed to air with CO2 concentration 400 ppm regularly.

TVOCs Sensor Specifications

Total Volatile Organic Compounds

- CMOS multi-pixel gas sensor technology
- Unmatched robustness against contaminating gases presents in real-world applications
- Outstanding long-term stability and low drift
- Measurement range: 0 – 60'000 ppb TVOC

Parameters	Conditions	Values
Measurement range ¹	Ethanol signal	0 ppm ² to 1000 ppm
	H2 signal	0 ppm to 1000 ppm
Specified range	Ethanol signal	0.3 ppm to 30 ppm
	H2 signal	0.5 ppm to 3 ppm
Accuracy ³	Ethanol signal	typ.: 15% of measurement value
	H2 signal	typ.: 10% of measurement value
Output range	Range:	Resolution:
	0 ppb – 2008 ppb	1 ppb
	2008 ppb – 11110 ppb	6 ppb
	11110 ppb – 60000 ppb	32 ppb

NOTE:

¹ Exposure to ethanol and H2 concentrations up to 1000 ppm have been tested.

² ppm: parts per million. 1 ppm = 1000 ppb (parts per billion)

³ 90% of the sensors will be within the typical accuracy tolerance, >99% are within the maximum tolerance.

Temperature and Humidity Sensor Specifications

- CMOS sensor technology
- High reliability and long-term stability
- High signal-to-noise ratio
- Fully calibrated, linearized, and temperature compensated output
- Very fast measurement time

Parameters	Conditions	Values
Measurement range	-	-40 to 125 °C 0 to 100 %RH
Accuracy		±0.2 °C ±2 %RH
Long Term Drift	max	<0.03 °C/yr <0.25 %RH/yr