



Sensedge Duct Air Quality Monitor

(Wireless, Battery-
Powered Model)



Specially engineered for HVAC environments, the Sensedge Duct is designed to monitor up to ten air quality and environmental parameters within supply or return air ducts.

Featuring a robust duct-mount installation and a dual-probe air sampling design, it delivers accurate, reliable, real-time measurements of the air being distributed through your HVAC system.

Product Features

Dual-probe precision

Custom dual-probe air sampling design with a pressure-stabilized sensing chamber ensures accurate, representative readings across varying airflow rates in real time.

True environmental sensing

External temperature and humidity sensor positioned directly in the airstream captures real conditions with fast response.

Flexible wireless setup

Battery-powered with up to 8 years of battery life - no cabling required. Utilizes Sub-GHz wireless communication to a gateway with cellular and Ethernet connectivity. BMS integration available.

Modular & upgradeable

Replaceable sensor modules allow quick swaps for long-term accuracy and easy maintenance. Optional filter efficiency attachment unlocks extra diagnostics and filter performance metrics.

Sensedge Duct (Wireless Model) is Available in 4 SKUs

	DU-300A	DU-301A	DU-300W	DU-301W
	Sensedge Duct (Wireless)	Sensedge Duct with Filter Efficiency (Wireless)	Sensedge Duct for WELL (Wireless)	Sensedge Duct for WELL with Filter Efficiency (Wireless)
CO ₂	✓	✓	✓	✓
Temperature	✓	✓	✓	✓
Relative Humidity	✓	✓	✓	✓
Particulate Matter (PM ₁ , PM _{2.5} , PM ₁₀)	✓	✓	✓	✓
TVOC	✓	✓	✓	✓
CO			✓	✓
O ₃			✓	✓
NO ₂			✓	✓
Filter efficiency attachment (dual-pressure and airspeed sensor)		✓		✓

Sensor Specification

Particulate Matter Sensor

(Available in all SKUs)

Sensor technology

Laser particle sensor (Light scattering)

Mass concentration size range

PM_{2.5}: 0.3 to 2.5 µm

PM₁₀: 0.3 to 10.0 µm

Mass concentration range

0 to 1,000 µg/m³

Mass concentration accuracy for PM_{2.5}

0 to 30 µg/m³: ±3 µg/m³

30 to 1000 µg/m³: ±10 % m.v.

Mass concentration accuracy for PM₁₀

0 to 30 µg/m³: ±3 µg/m³

30 to 1000 µg/m³: ±15 % m.v.

Sensor output resolution

1 µg/m³

Calibration

Calibrated against standardized aerosol mix

WELL specification requirements

Adjustable particle density (K-factor) to accommodate project/region-specific particulate profile.

Complies with [WELL Performance Verification Guidebook](#) to be used in WELL certification.

Relative Humidity Sensor

(Available in all SKUs)

Sensor technology

Digital sensor

Measurement range

0 - 100 %RH

Accuracy

±2 % RH

Sensor output resolution

0.1 % RH

Temperature Sensor

(Available in all SKUs)

Sensor technology

Digital sensor

Measurement range

-20 - 100 °C

Accuracy

±0.2 °C

Sensor output resolution

0.1 °C

TVOC Sensor

(Available in all SKUs)

Sensor technology

Multi-pixel metal oxide sensor (MOx)

Target gas profile

Complex mixture of 22 VOCs¹ as defined by Molhave et al.

Measurement range

0 - 1,382 ppb

0 - 5,482 ug/m³

Accuracy

±15 % ±4 ppb

±15 % ±18 ug/m³

Sensor output resolution

1ug/m³

Calibration

Ethanol in clean air

Sampling process

Passive

WELL specification requirements

Calibration gas: ethanol

Target gas profile (ppb=µg/m³ conversion factor under STP): 22 VOC mixed per Molhav et al. (1 ppb = 4.57 µg/m³)

Complies with [WELL Performance Verification Guidebook](#) to be used in WELL certification.

CO₂ Sensor

(Available in all SKUs)

Sensor technology

Non-dispersive infrared (NDIR)

Measurement range

400 to 5,000 ppm²

Up to 10,000 ppm extended range³

Accuracy

± 40 ppm ± 3%⁴ (Comply with ANSI/ASHRAE Standard 62.1-2022)

Sensor output resolution

1 ppm

Target gas

CO₂

O₃ Sensor

(Available in DU-300W/301W)

Sensor technology

Electrochemical

Measurement range

0 to 2,000 ppb

Accuracy

0 to 100 ppb: ±10 ppb

>100 ppb: ±10 %

Typical response time

(T90): < 120s

Sensor output resolution

1 ppb

Recommended lifetime

3 years

Interference gas

CL2

Target gas

O₃

CO Sensor

(Available in DU-300W/301W)

Sensor technology

Electrochemical

Measurement range

0 to 100 ppm

Accuracy

0 to 20 ppm: ±1 ppm

>20 ppm: ±5%

Typical response time

(T90): < 60s

Sensor output resolution

0.1ppm

Recommended lifetime

3-5 years

Interference gas

Not listed

Target gas

CO

NO₂ Sensor

(Available in DU-300W/301W)

Sensor technology

Electrochemical

Measurement range

0 to 2,000 ppb

Accuracy

0 to 100 ppb: ±10 ppb

>100 ppb: ±10 %

Typical response time

(T90): < 120s

Sensor output resolution

1 ppb

Recommended lifetime

3 years

Interference gas

CL2

Target gas

NO₂

Filter Efficiency Add-on

(Available in DU-301A/301W)

Sensor technology

Differential pressure (Thermal mass flow)

Filter pressure drop (2 channels)

Range: ±500Pa

Accuracy: 3%

Resolution: 0.1Pa

Duct air flow (1 channel)

Range: 1.5 - 20m/s

Accuracy: ±10%

Resolution: 0.1m/s

Device Specification

Power

Battery: 6 x Li/SOCI2 AA size

USB-C: 5V 0.5A (Cable not included)

PoE: Via PoE to USB-C converter (Cable not included)

Battery Life

Up to 8 years of battery life⁶ using Adaptive Sampling™ and 3.5 years using a high frequency fixed sampling rate^{7 8}

Connectivity

Frequency range (MHz):

Sub-Ghz wireless communication

IN865/EU868/US915/AU915/KR920/AS923

These frequency bands cover over 200 countries, contact Kaiterra for details on compliance in your location.

Gateway supports cellular⁹ and ethernet

Integration

BACnet/IP via Gateway

Installation

Duct mount with screws (on supply and/or return air ducts)

Data Logging & Storage

Data Storage:

Cloud storage

Local data storage: 0.5 days

Data sampling:

Adaptive Sampling™ to automatically adjust sampling frequency to maximize battery life.

Selected sensors support a configurable sampling rate from 1 minute to 24 hours.

Modules & Calibration

Compatible modules:

KM-300: Particulate Matter sensor module

KM-308: CO, O₃, NO₂ sensor module

Calibration: Swappable sensor modules

Operating conditions

Operating temperature: -20 to 50 °C

Operating humidity: 5 to 95 %RH, non-condensing

Size & Weight

Without filter efficiency feature:

Length: 375 mm (14.76 in)

Height: 300 mm (11.8 in)

Width: 300 mm (11.8 in)

Weight: 1488 g (3.28 lbs)

With filter efficiency feature:

Length: 375 mm (14.76 in)

Height: 300 mm (11.8 in)

Width: 300 mm (11.8 in)

Weight: 2388 g (5.26 lbs)

1. n-Hexane, n-Nonane, n-Decane, n-Undecane, 1-Octane, 1-Decene, Cyclohexane, m-Xylene, Ethylbenzene, 1,2,4-Trimethylbenzene, n-Propylbenzene, a-Pinene, n-Pentanal, n-Hexanal, Iso-propanol, n-Butanol, 2-Butanone, 3-Methyl-3-butanone, 4-Methyl-2-pentanone, n-Butylacetate, Ethoxyethylacetate, 1, 2-Dichloroethane
2. Extended exposure to concentrations below 400 ppm may result in incorrect operation of ABC algorithm and should be avoided.
3. Sensor provides readings in the extended range but the accuracy may be lower than that specified in the table.
4. The accuracy specification covers environments ranging from 0-50°C and 0-80% RH, and complies with indoor air quality standards ANSI/ASHRAE Standard 62.1-2022 at 25°C.
5. Sensor specifications are under controlled laboratory conditions. Field measurements may use localized ambient air quality and historical infiltration rates to enhance the accuracy and baseline readings of NO₂ concentrations. This method is effective under typical indoor conditions but may not suit environments with persistently high indoor NO₂ levels.
6. Using Adaptive Sampling™ in a building with 15 devices, located in a typical North American city with mechanical ventilation and strong wireless signal strength to the gateway.
7. During operating hours (9-5, Mon-Fri): one sample per minute for all sensors except particulate matter, and one sample every 10 minutes for particulate matter. Outside of operating hours: one sample every five minutes for all sensors except particulate matter sensor, and one sample every 60 minutes for particulate matter.
8. Actual battery life may vary based on usage, environmental conditions, and other factors. Model SE-300W has a battery life expectancy of 3.5 years. Model SE-300L has a battery life expectancy of 8.5 years.
9. Cellular is supported in select countries and regions.